THE AMERICAN OMEN

BY GARET GARRETT

The distinguished Boston merchant and philanthropist, Mr. Edward A. Filene, says of this book:

> **"'The American Omen' by Garet Garrett, is to me an omen of a new literature. It is a book about business, but it is not just another business book. It is a book which should interest every intelligent and enquiring American quite as much as it interests the business man: for, through its interpretation of our economic evolution, it gives us the true key to our social evolution, and the changing human life of these stirring times which it is the true province of literature to interpret."**

MR. SISLEY HUDDLESTON, well-known English writer and critic, said of *THE AMERICAN OMEN*, by GARET GARRETT.

"Recently I returned from the United States where I made some study of the industrial revolution—for it is nothing less—that has taken place in that country. . . . The United States has flung overboard our old conceptions of capital, profits, and wages. It has discovered that there are no such 'laws' as were laid down by Adam Smith, Ricardo, John Stuart Mill, and even Karl Marx. . . . I affirm that there is throughout America an entirely new attitude towards social and industrial problems, and that, perhaps for the first time in the history of the world—there is a general recognition that prosperity depends on the well-being and wealth of the worker; that the chief function of the employer is to make it possible for the worker to purchase freely; and that the secret of national success is not large profits and low wages, but low costs and high wages. . . .

"The clearest exposition, though it is of popular character, is that of Garet Garrett in *The American Omen* (published by Dutton of New York). . . . It is an admirable piece of work which could be consulted profitably by every one who is interested in the lessons that the United States can teach us."—From *The New Statesman*, Dec. 28, 1929.

Digitized by the Internet Archive
in 2010

http://www.archive.org/details/americanomen00garr

THE AMERICAN OMEN

Garet Garrett has also written

THE CINDER-BUGGY

SATAN'S BUSHEL

OUROBOROS, or The Mechanical Extension of Mankind
(Today and Tomorrow Series)

HARANGUE

PUBLISHED BY E. P. DUTTON & CO., INC.

THE DUTTON BOOK OF THE MONTH

The AMERICAN OMEN

BY

GARET GARRETT
Author of "Ouroboros," "The Cinder-Buggy," etc.

WITH AN INTRODUCTORY NOTE BY
EDWARD A. FILENE

E. P. DUTTON & CO., INC.
PUBLISHERS :: NEW YORK

THE AMERICAN OMEN, COPYRIGHT, 1928
BY E. P. DUTTON & CO., INC.
ALL RIGHTS RESERVED : : PRINTED IN U.S.A.

NEW EDITION.....February, 1930.

INTRODUCTORY NOTE

BY

EDWARD A. FILENE

"THE AMERICAN OMEN," by Garet Garrett, is to me an omen of a new literature. It is a book about business, but it is not just another business book. It is a book which should interest every intelligent and enquiring American quite as much as it interests the business man: for, through its interpretation of our economic evolution, it gives us the true key to our social evolution, and the changing human life of these stirring times which it is the true province of literature to interpret.

CONTENTS

		Page
WITNESS OF EPOCH		3
I	Interrogating the face of change	3
II	Why has the sign of world supremacy passed to this hemisphere?	5
III	The false war myth	10
IV	Facts that cannot explain themselves	13
REVOLT OF THE MIND		18
I	The American mentality	18
II	Native ways of thinking	24
III	Struggle with the old world's doom book of political economy	28
IV	The sacred law of poverty	31
V	The thought that overthrew it	40
CONFLICT		43
I	Native ways of feeling	43
II	The economic secret is human	48
III	Discoveries in understanding	59
IV	Evolution of scientific management	68
V	Thought is emotionalized, feeling is rationalized, and the revolution is complete	73
KEYS TO PLENTY		78
I	New time	78
II	The forces of production set free	82
III	Mechanical extensions	86
IV	Dilemma of quantity	90
V	Save the man; spend the machine	94
VI	Our fifty tame slaves per capita	97
VII	Effects of this American tempo	100

		Page
VIII	On the capital function of money	103
IX	On the output of wealth and power of consumption	107
X	On Wall Street control of business	110
DIVISION		113
I	Yours and mine and ours	113
II	The irrational dispute	115
III	Creative parts	121
IV	The exploiting lord's solution	125
V	Uprooting the low wage fallacy	128
VI	Finding the true law of wages—a law of proportion	132
VII	Application of that law also to profits	138
VIII	Bankrupt antagonisms	145
THE NEW MEANING OF BUSINESS		151
I	Rise of the moral structure	151
II	What was there before	153
III	Motives	159
IV	The age of dread—socialism, revolution or self-conquest	167
V	Sudden advent of a power no law could tame	170
VI	Business immemorially stigmatized as a vulgar art	173
VII	Its social redemption	175
VIII	The word and spirit of service	182
IX	Penetrations	186
TOMORROW		191
I	The question: Is prosperity unlimited?	191
II	Concerning the idea of progress	194
III	Two fears	196

		Page
IV	Overproduction classically regarded as a menace	199
V	Its other meaning	203
VI	Two reasons why people may be unable to consume what they produce . . .	207
VII	Overproduction regarded as the price of greater plenty	213
VIII	The second fear annuls the first . . .	217
IX	Efficiency as a new dimension	220
X	Vast margins	223
MACHINE PEOPLE		228
I	Man's fear of machines is dread of himself	228
II	All wheels do run by faith	233
III	Exploring the absolute sea	240
IV	No way to go back	245
V	The incorruptible image of truth . .	250
VI	Its effect upon our minds and behaviour	254

VISTA

THERE have been two great American constructions.

The first was political. Perilous ideas of common freedom were put headlong to a working trial; and the proof now is that among the major units of human society this is the only one that has endured as a nation for a century and a half by no grace of king, priest, tyrant or dictator.

The second was economic; and here now is a standard of common living the highest so far as we know in the history of the race.

Beginning to appear are the ground signs of a third construction. Its significance, if it happens, will be social.

Freedom as we know it is a condition of ego. Prosperity is a condition of things. Increase these satisfactions to any degree and there is still that knowledge of incompleteness which torments the spirit. This is the anxiety of the perishable I fragment to make affinity with an imperishable whole. Beyond the sense of belonging to himself man craves also the sense of himself belonging. We are bound to live two lives at a time. One is our own, a little arc, sudden and discontinuous; the other is the life of society, perpetual and perhaps immortal. To live them consciously, without conflict, so that one shall fulfill the other, is the next achievement. Necessity lies in one, completion in the other.

That servile status of the individual binding him to the sceptre, to the state, to the lord, to the land on

which he grew, with no inalienable rights of being, is the oldest political story. The extreme revolution, wherein the state itself becomes the cringing body, mob-serving, owing everything to the individual who owes it nothing in return, is a complicated modern story, with some fearful and abrupt periods. An entirely new story would be that of a people jealously egoistic dedicating their freedom to a social imperative discovered in themselves and learning by that act what freedom is for.

In the mirror of faith there is already reflecting an aerial image of this third great American construction. Let us be not discouraged if for moments together it disappears from view. Its beginnings, as were those also of the other two, are involved in confusion, uproar and episodes of disaster, with besides some aspects of new unsightliness. This is inevitable. We stand too near. So however the world was made, it was not made without much waste and litter; and truth itself must first come true.

THE AMERICAN OMEN

THE AMERICAN OMEN

WITNESS OF EPOCH

I

Interrogating the Face of Change

TO stand first in the earth, paramount thereon, is the part of one people at a time by lot and period. The sign regnant went to and fro in Asia before there was any western civilization, and sometime gilded the dome of Africa. Rome conquered it. For a thousand odd years it was lost; then it rose again in Europe. Now it comes to us. Its migration to this hemisphere is a fundamental event and one mighty for change.

World supremacy is not by golden chance. Such an idea was the bad star of Spain 400 years ago. What was it then seated England in that office of power? Economic facts, perhaps. Rich coal measures at tidewater, skill of trade and banking, argosies, a monopoly of machine craft. Yet she had no ore. There was other coal. The Dutch were great traders and bankers, with many ships, before the English knew the art of international commerce. And as for machine craft, anyone so minded might have beaten her at it. The Germans, when they were ready, did it in thirty years.

The weakness of economic explanations is their suave plausibility. They pass over the historical footnote that says supremacy has in every case indicated a significant contribution to the data of human

experience. In the case of Great Britain, was it an errand to the backward peoples of the earth in the guise of trade, or was it to demonstrate the first age of industrialism? It may be too soon to say. But imagine wiping out the fact of British supremacy as if it had never been. Would the world be a different place? Or in the same way erase the fact of Roman supremacy. Certainly life now would be in some ways very different. Yet you cannot say precisely how; you cannot say what would have happened in place of what did.

And now American supremacy regarded as an event: What does that mean?

Here is the beginning of power in new series with new meaning. Never before had people so much power either actual or relative. The fact came suddenly to view, as if it had not been historically prepared, and that is a way of happening peculiar to the things of destiny. Nobody knows what destiny is. If perhaps it is in itself a necessity higher than our own, we do not know what law it obeys. But we may be sure it cannot act where there is nothing to be acted upon. To bring its ends to pass, it must be supposed to require conditions. Therefore, as concerning the cause, whether you conceive it to have been circumstantial or mysterious, you come to the same question. You may ask by what means we have arrived unawares at this place or you may ask what was here to attract this destiny. It is all the same.

What were the conditions?

II

Why Has the Sign of World Supremacy Passed to This Hemisphere?

Other people are asking, most anxiously the people of Europe, because world supremacy in one hand or another had been so long a possession of theirs that they had come to think of it as a natural right. Engineers, bankers, economists, trained observers and various missions under private and public mandate have been sent hither to discover the sources and secrets of American power. What they have found and reported in every case were the effects. Wealth, prosperity, method—these are the functions of American power; works and things are its visible aspects. Wipe them out entirely and they will presently appear again for the same first reason and in the same meaning. No foreign analysis of what is working in this country has discovered either that reason or that meaning.

The German investigators, with no word in their own language for what we mean when we say prosperity, have been deeply impressed by the rationality of our mechanical and methodical procedures; they have already produced a literature on the rationalization of industry, which is now having vogue throughout Europe; and they have, of course, been rationalizing German industry, more or less as the Berlin banker rationalized his clerical department after having seen in the Federal Reserve Bank of New York time-saving equipment and method by

means of which one American clerk did the work of twenty German clerks. He imported both the equipment and the method and let out nineteen clerks in every twenty; but when an American asked him if he had raised the pay of the twentieth clerk he was unable to comprehend the meaning of the question. Had the clerks bought the equipment or discovered the method? No. Did the twentieth clerk work any harder than he had worked before? No. Then why should he have more pay? That view, of course, is rational.

The British have identified a more significant effect. They have been seeking the American secret of high wages.

A London newspaper sent a delegation of trades-union people on a voyage of discovery. They visited many works, touched the fur coats and silk garments in the individual lockers of American industry's women workers, stared at the wage earners' motor cars parked by hundreds around the factory, talked a good deal about wage-rate systems and the different theories that govern them—and went home no wiser. Their report was a tale of wonder.

Two British engineers produced a sensation with a book on the dynamics of American industry. More mechanical power, keener instruments, better method and mass production at low costs—there was the secret. Let England mind. But here again the mistake of taking effect as cause. Multiple production, now called mass production, is as old as industrial machines; Great Britain had it first. What makes it so astonishing to them as they now see it in

the United States is the degree of its development, which is merely an effect. Besides, there is mass production in Great Britain directly copied from us. You may see it. At Oxford is a motor plant where the form of practice, moving chain and all, is as it is in Detroit. An American, who was neither an engineer nor an industrialist, going through this plant, came to the paint job. They seemed particularly proud of it and said to him, "Here we can paint a body in two minutes."

The American, knowing the output, made a mental calculation and said, "In that case you might easily do the whole job in one stall. Why four stalls here in the middle of your plant, making a bad traffic jam, when you could paint all your bodies in one?"

They said, "Our customers, unfortunately, are not so easily pleased as your own. We have to give them a choice of at least four colors."

The American said, "Yes. Still, why four stalls when one would do?"

They said, patiently, "Don't you see?—the man there now is spraying black paint. The next body may call for blue. If he should have to blow all the black paint out of his tube and clean it for blue, that would be wasteful of time and material—what you Americans call inefficient."

The American said, "Yes. But why not four tubes to one stall?"

They were silent for a minute, and then answered, "Do you know, that idea had never occurred to anyone here."

The American tried to think of some way to tell

them why it would be impossible for such an idea not to occur to someone in an American plant, why it might occur just as easily to the man handling the paint tube as to the superintendent, why the man at the paint tube could not help imparting it once it had occurred to him, and why—— But he gave it all up and said nothing. There was the form and not spirit.

Then a royal British delegation was appointed by His Majesty's Government to study and report on industrial conditions in the United States. It did a typical British job, full of excellence, and reported, among other discoveries, that:

"The workpeople accept experiments toward reduced costs of production, as they have always found that the result of lower costs has been increased consumption and consequently more employment."

The British point of view is explicit in the term "workpeople." It is thereafter implicit in the assumption that when costs are reduced and consumption consequently has been increased, the blessing of it to the workpeople is simply more employment.

Lastly, the League of Nations decides to make a careful study of American industry in contrast with that of Europe in order to see if it will be possible, quoting the words of Monsieur Loucheur, "to transpose certain parts of the American system into the European system."

As well speak of transposing certain parts of a tree. You might have all the parts, yet without the subtle principle of the living tree, the natural laws

of its origin, growth and reproduction, you would have only lumber for your pains. The whole American industrial system is an effect—the mere visibility of invisible powers.

What parts of it, as parts, Europe would like to transpose are not hard to guess. One of the French explorers was André Siegfried, an eminent economist, who wrote a book entitled *America Comes of Age*. A brilliant book, containing glimpses of deep political insight. The French mentality is political. But as to the American industrial system, touching the same idea that now animates the economic mind of the League of Nations, Monsieur Siegfried says:

"The question that Europeans find most intriguing is whether America will be able to withstand international competition and at the same time maintain her enormous wages and exceptional standard of living. Possibly we are not aware of the immense effort that has been made since the war to adapt American industry to the change in the labor market, by installing the very latest equipment. One is almost tempted to state that Europe, with her intelligence, technical perfection and high civilization, could adopt the same policy and also profit by her lower wages and less pretentious mode of living."

Which is only to show how far he had missed it—the secret they all come seeking.

They see in the American system low costs of production, high wages, high standards of common living; and they think, "If only we had those low American costs with our low European wages, how profitable that would be!"

III

The False War Myth

What they seek is not obvious. All the truth of it is new and fundamentally strange to Old World traditions and mind habits. But there is one definite and fatuous reason why they miss it. Their characteristic approach is under tyranny of the idea that Americans got rich in the war. Thus all the higher phenomena of American prosperity appear to them to have occurred by chance and to wear an aspect of post-wartime unreality. Even when upon reflection they recognize that other causes must have been acting, still, almost invariably they put that notion first. It has become a morbidity of European thought. For a fairly complete representation of it see any European article on the subject of war debts or on the possibilities of an economic union of Europe against the United States.

The royal delegation appointed to study industrial conditions in the United States could not avoid the thought that we had been war-made. It wrote:

"The war gave an impetus to the expansion of manufacture in all branches of industry and left the United States a creditor nation in relation to Europe." Immediately it was obliged to add: "Since 1922 there has been a rapid increase in the volume of manufacture in most branches of industry."

It is true, the war stimulated industry in the United States, necessarily; it stimulated industry also in Great Britain, France, Germany—everywhere—to the utmost. That after the war there was

not a farther expansion in Europe, such as occurred in the United States, is the crucial fact. Conditions were similar on both sides. Inflated wages, high costs, people wanting more things than they had ever wanted before, and from the war an industrial capacity much greater than had ever existed in peacetime. The problem was the same there as it was here—whether to cheapen goods or cheapen labor.

One way is to satisfy more wants; the other way is to limit them. We cheapened the goods simply by increasing the productivity of labor, and found not only that what had been regarded as an excess of industrial capacity could be employed but that more and more was needed.

In July, 1926, the Monthly Labor Review, published by the United States Department of Labor, said: "We are at the present time experiencing the most remarkable advance in productive efficiency in the history of the modern industrial system." That means the cheapening of goods; it means low costs and high wages. The aim is prosperity.

This advance in productive efficiency was the direct cause of that rapid increase in the volume of manufacture since 1922 referred to by the royal delegation. The war stimulus had nothing whatever to do with it; neither had gold anything to do with it, nor the fact that we had become a creditor nation in relation to Europe.

It is not entirely from selling itself a political propaganda against debt payment that the European mind becomes fixed upon the thought that it

was the war made Americans rich. The European mind's traditional way of regarding wealth, conceiving it to be a product whereas we conceive it to be a factor, would hinder its understanding. As we think of wealth it is not a sum, variable only by addition and subtraction, nor is it extent of possession. It is a body of great means, containing a principle of proliferation that causes it to increase by division.

We think much less about wealth as such than about prosperity, and they are not the same. The measure of prosperity is not what people possess; it is what they consume. The per capita wealth of Robinson Crusoe's kingdom was very great. Two men possessed everything. Yet their state of prosperity was low, because without the engines and tools to multiply the power of their hands they could not produce more than enough to satisfy the wants of simple necessity. All the gold in the world, all the foreign investments in the world, plus unlimited sources of raw materials, would not have increased their prosperity in the least.

So in the foreign doctrine that the United States got rich in the war one must recognize both malice of fable and disability of view.

The facts are these: Above their own exertions in the war, the American people, out of their own resources, produced and loaned to the Allies goods to the value of $10,000,000,000. Then in the first ten years after the war, the American people, though their own wants were rising, nevertheless produced and loaned to European and other foreign countries goods to the value of $15,000,000,000 more. For

these goods we hold receipts in the form of paper promises to repay. Whether in fact we shall ever be repaid, or if so, how, we do not know. That is not the topic. The question is how the United States could have got rich, how its prosperity could have been increased at all, by lending away to other people in the course of twelve years some $25,000,000,000 worth of consumable goods.

If we were receiving any of them back, or the material equivalent, it might be supposed that we were now enjoying a postponed power of consumption. But we are not. We are still lending away more than we are getting back. All we have to show for the goods we have loaned away to Europe are bonds—some of them of very dubious value. We cannot eat or wear foreign bonds, we cannot ride them, we cannot use them as T-beams or turbine blades, and they have no fuel value. Among all the absurdities of economic thought, this is perhaps the one most weird, that a nation may achieve prosperity by exporting more goods than it imports.

IV

Facts That Cannot Explain Themselves

No material part of the spectacle of American prosperity is owing to the war; it is in spite of the war, in spite of our having loaned away, perhaps forever, enormous quantities of goods that we have not ceased to want for ourselves. It may be that we owe to the experience of war a sense of power that might otherwise have come a little more slowly, a

lesson in solidarity, a clarification of the national mind, a new faith in our own values; but it is no such business of the spirit people mean when they say it was the war gave Americans first place in the world.

Explanation turns next to the catalogue of America's natural advantages. Item: The extent and variety of our resources in raw materials. Item: Our self-containment in essential food staples. Item: The size of our jealously protected domestic market, with its apparently insatiable capacity to absorb goods. Item: Enormous quantities of cheap mechanical power. And so on.

But what all this amounts to is simply description. It may be that for world supremacy to pass from Europe to America it was necessary that we should possess these advantages: it is none the less certain that merely the fact of our possessing them was not the cause of that event. Try but a few simple reductions.

Raw materials?

Access to sources of raw material has presented no problem to Europe in the past, nor does it present any problem now. Those who are urging an economic union of Europe against America already are boasting that Europe, with her vast colonial possessions, is superior to the United States in such resources, and this is undoubtedly true. Moreover, there is the fact that the United States is the world's heaviest buyer of raw materials. We are, for example, Great Britain's largest rubber customer.

Our self-containment in food staples?

Europe for more than half a century has delib-

erately pursued the policy of exchanging manufactured goods for food, that is to say, skilled labor for peasant labor—as a paying proposition. Besides, the market for food staples is an international market; the price is a world price.

The capacity of our domestic market?

This is, of course, very important. No country in Europe knows the capacity of its own market, for the simple reason that not one has ever systematically or intensively explored it. Only now, in the American example, are the industries of Europe beginning to regard the possibility of really exploiting domestic trade.

Our supply of power?

That we use much more mechanical energy per capita than any other people is not owing to the extent of our power resources, nor to the fact that our power is cheap. We do not use it because it is cheap; it is cheap because we use it. Europe has not utilized her resources to anywhere near the same degree. Nor is it that our engineering and technical skill is superior. England knows better than to waste energy by millions of horsepower burning her coal in open grates.

In any case, the physical, geographical and political conditions were all previously known. Why should foreign countries be sending missions to the United States to confirm such facts as may be read out of the almanacs and yearbooks of any modern language? We have no hidden natural resources, no secret sciences, no inventions that are not for sale. It is supposed that in the extremes of mechanical

skill we are inferior, and this may well be true. In technical knowledge we are not superior. There is nothing we make that other people may not make also, as well or perhaps better. We have nothing in the way of industrial method that is not published in trade journals and magazines of technology. Anyone is free to copy our methods. The League of Nations is welcome to transpose the American system into the European system by part or whole; we make no mystery of it. We have no new ideas among us, abstract or concrete, but we give them immediate circulation in print.

The American book lies open. It explains everything and is itself unexplained. Who expounds the meaning that underlies the text?

What is new in the world is without a name. It is not a system, not a method, not yet a formulated philosophy. Out of it is proceeding a new reality. American prosperity is its light and witness.

Do we understand it ourselves? Our relation to it is functional, not contemplative. Take certain premises in the interrogative case, as for example:

American business is unlike business anywhere else; it is unlike itself as it was only a few years ago. Wherein is this difference and what are its principles?

Formerly the American business man, like any other, was content with money profit alone; the degree of his profit was the degree of his contentment. That is no longer true. What has happened to him?

We were once facing all those evils of laborism,

such as limitation of output, demarcation of jobs, puerile jurisdictional tyrannies, that still hinder the prosperity of Great Britain; there was a babel of counsel, no one knew the way out. Yet we escaped. How?

We had capitalism here in its dangerous forms. But now, as we know labor without laborism, so we know capital without capitalism. How is that?

We have gone much further than other people with standardization and mass production, and yet what was predicted as an inevitable consequence of this method when it should have been carried to the American extreme—namely, that it would reduce human beings to the mindless condition of automatons—has not happened. So far otherwise, what strikes the foreign observer deeply—even the English, who most of all dread losing their individualism to machine craft—is the individualistic character of American wage earners. What does that signify?

Why is the conflict of man with himself and with his environment more creative here than in countries that are older in culture, richer in experience and had first possession of the transforming power of machines?

The American's own first impulse is to recite facts from the open book that tells what we are doing and how we are doing it and yet contains no account of itself.

REVOLT OF THE MIND

I

The American Mentality

THE first necessity is to comprehend American prosperity as idea. Its works are for use and wonder; but the works of a people can be nothing else than their thoughts externalized. If we are making an original attack upon the economic aspects of reality, it follows that we have among us, and must have had to begin with, original ways of thinking. What are they? How do Americans think?

The American mind possesses certain characteristics uniquely its own. So does the German mind, the French mind, the English mind—any collective mentality. Wherein they differ one from another may be a matter of very subtle comparison, and yet from the projection of such differences comes all contrast.

Consider the American mind on its inventive side. Whether it is more or less inventive than the European mind is often debated. Suppose it were either more or less. There might still be an important difference in how it employs the inventiveness it has, and in fact there is. This can much better be illustrated than defined.

A Russian removing a dead horse from the stable premises proceeds in this manner: He arrives with a live horse and wagon, alone. It is the wagon you first notice, for it is high and narrow, with a rack around it, and has no tackle or equipment for handling a carcass. You wonder how he expects all by

himself to lift half a ton of dead horse into it. Leisurely he proceeds to do that thing. He unhooks the live horse and uses it to drag the carcass to a position parallel to the wagon and about five feet from it. Next he goes to the other side of the wagon and with the leverage of a pole first sets it rocking and then tips it over toward the dead horse on the ground. Now, with the wagon resting on its side, almost touching the carcass, he passes a rope around the neck of the dead horse, which is limp, and easily lifts it—the neck alone—to the center of the wagon bed; there he suspends it by making the end of the rope fast. Another rope he ties around the rump, and the free end of that rope is laid around the hub of the upper rear wheel, which, with the wagon on its side, revolves in a horizontal plane.

Now, using the wheel as a powerful windlass, he lifts the whole body of the dead horse to the center of the wagon bed, where he suspends it, as he suspended the neck, by making the rope fast. With the carcass secured in the bed of the wagon, it is easy to tip the wagon back again to its natural position by using the pole as a lever; or, if that is too much exertion, he can do it with an overslung rope attached to the live horse. This done, he hooks the live horse to the wagon and disappears.

That the particular Russian one may happen to see at this job did not invent the procedure is irrelevant. It is a fine example of Russian ingenuity. No American could beat it, because, given the difficulties, the solution is perfect. The Russian is thus resourceful with difficulties; he invents ways to over-

come them. But he accepts the difficulties to begin with. There is the point

A typical American, watching this Russian, would not be in the least impressed by the ingenuity of the performance. He would say, "How dumb!" meaning how stupid in the first place to accept the difficulties. Why not remove them? That is his impulse —remove the difficulties, change the facts. Specifically, he thinks of a wagon built for the purpose, low swung on bent axles, with proper tackle attached. Having imagined the special wagon, he asks himself if it would pay. Perhaps not. Such a wagon would not be right for general purposes also. Therefore the special wagon calls for an organized special activity. With two or three of them one might remove all the dead horses in Moscow. Then it would pay.

Such is the American's natural process of mind. Hence new forms, new methods, then new difficulties and more new forms and methods, all in a state of fluid change.

Another rare characteristic of the American mind requires in the same way to be illustrated. Thomas Edison has been a deep observer of it. Some years ago, when electric locomotives were evolving, he used to ask:

"Have you seen that big electric engine on the New York Central Railroad—how the power is coupled to the wheels? No? I'll tell you a story about it to show what happens to any of us when we get in a rut from knowing too much about the difficulties. Those engineers had finished the engine, all

but one detail. They couldn't think of a proper way to get the power down to the wheels. That silly problem has bothered engineers all over the world. You will see if you look in how many different ways they have solved it. Well, these engineers were stuck, all in a rut. They had looked at the thing so long and knew so much about it that they couldn't see it. So they posted a notice. Five hundred dollars to anyone who could make a working suggestion. Weeks passed. Still nobody could think of a way to couple the power to the wheels.

"One day a boy from the drafting room stopped at the chief engineer's desk and made a little scrawl of a pencil sketch. 'I don't know anything about it,' he said, 'but would this work?' The engineer looked at it and said he believed it might—and it did. You will see it working the next time you leave the Grand Central Terminal. That boy wasn't in a rut. He didn't know what the difficulties were. He just looked at the thing."

That is what has been called the theory of ignorance. Clearly, ignorance is not the right word. Innocence is not much better. There is no exact word for what is meant, which is that in order to act upon a thing in an original manner you must be able to see it naïvely, with no prepared ideas, taking nothing about it for granted. So Edison works. If he were an economist he would not take the law of supply and demand for granted. So Ford works. They are only celebrated examples. The head of the largest industrial research laboratory in the country —in the world—began with a gang of linemen.

From post-hole digging to the mathematics and physics of high mechanics by common sense and skepticism! It is one of the notable traits of our common mentality and so well known that an expression of it occurs in vernacular speech: "Show me! I'm from Missouri!"

It is important as a negative fact that the American is not political minded. Superficially, this may seem—and probably is—untrue; fundamentally, it is so. Certainly, no other people so distrust the political approach to an economic problem. On the part of capital, this is fairly notorious. The same instinct for keeping politics and economics apart acts with labor. Trades-unionism in Great Britain, for example, is definitely political. There is a Labor Party, and there has been a Labor government. Here trades-unionism is just as definitely economic; temperamentally it is so, to the despair of an American cult calling itself liberal, from some notion it has of kinship with the Liberal Party in British politics. This fact of separation runs very deep, if you follow it down, and has structural significance in the American scheme.

Anciently it was that the individual existed for the state in all senses, political, moral and economic. The true crime of Socrates against the Greek state was to have taught the doctrine of individual rights; the political offense of early Christianity was of the same root. In the course of 2000 years the individual became supreme in the highly civilized forms of Western society. The ancient doctrine was quite

reversed. The state was declared to exist for the individual.

The perfect acknowledgment of this modern idea is in Great Britain, where a man, because he is British born, is entitled to sustenance and to a certain standard of living, irrespectively of what he may or does produce. He does not always get the kind of living to which he feels entitled and his disappointment is a chronic political issue. The Englishman who says the state owes him a living utters an opinion that everyone accepts. If he has no job the state must keep him in doles; if his wage is insufficient to provide him a decent living the state must house him in a manner of minimum comfort, and so on.

Here, if a man says the state owes him liberty, protection, equality of opportunity, that is already acknowledged. These are political benefits. But if he says the state owes him a living he is ridiculed; if he insists we know there is something wrong with him. He is a failure, a ne'er-do-well, a nuisance. Here the state exists for the individual in political senses only; economically the individual is on his own.

Where it is otherwise—that is, where the active responsibilities of the state to the individual are both political and economic, there equality of opportunity, which is a political conception, passes into the economic life as levelment of reward. That is finally to penalize efficiency for the benefit of inefficiency. Under that condition such a thing as a fast piece worker receiving a higher rate per piece than the slow worker would be unknown.

This is one of the special features of the American wage system and represents a revolution of thought. As economics, it is sound in a new light. Obviously the labor of one who lays 2000 bricks per day in the wall of a building is worth more than twice as much as the labor of one who lays only 1000. It is worth more per brick, because it brings the building so much faster to completion, with all that means in time and interest saved; or, in the case of two costly machines exactly alike, an output of 2000 units per day from one is cheaper per unit than an output of 1000 units per day from the other; and rightly for that reason may bear a higher reward per unit to the one producing it. As a method, however, it is not possible until both capital and labor see it alike in principle and labor can trust the employer not to break the basic piece rate simply because the efficient man is making a handsome wage.

II

Native Ways of Thinking

Given these three characteristics of mind, you might expect strange American answers to the Old World problems and riddles of industrialism.

You will remember that industrialism was immigrant here. We did not conceive it. Its spontaneous appearance was in Europe. When it was half a century old and highly developed there, life in this country presented still an agricultural picture. We came late to machine craft. Europe's darling ambition was to monopolize it in order to be able to

exchange manufactured goods with the rest of the world for food and raw materials. We imported machines when we could, and when it was impossible to buy them, owing to the European embargo, then we held out inducements to men who could carry the plans in their heads and build them here.

And as we got from the Old World the primary methods and mechanisms of industrialism, so at the same time we got the European ways of thinking that had attended it. We imported the European book of political economy. It did not belong here. It was a manual of instructions we had done better perhaps never to have read at all.

There is grimness in the fact that a people departed from Europe to find freedom of mind and spirit in the wilderness of the New World and to embrace the dignity of labor should have imposed on themselves unawares at the beginning of their industrial career a set of Old World formulas, called the science of economics, that had come straight up from traditions of feudalism, caste and peasantry. That was one more piece of mysterious evil to challenge the enterprise of Puritan faith.

You may take it classically that the science of political economy is the study of the creation and distribution of wealth. Historically, in Europe, it shows three principal figures—namely, the Utopian, the apologist and the radical. The Utopians are those who flee from reality and take refuge in fantasy. The apologists are those who hold that what is was to be. The radicals are those who propose to seize the moneybags.

Dissimilar as they earnestly think themselves to be, they are rooted all alike. In the manner of the Russian loading the dead horse, they accept the difficulties. They find industrialism working in a certain way and say that is the law of industrialism. They find capital working in a certain way and say that is the law of capital—the law of its nature, as if it had an immutable nature! They find men behaving in certain ways for gain and say this is the law of economic motive. They are one in despair.

The Utopians have generally said mankind was spoiled in his nature by bad rulers and bad experience; so they have taken man as he ideally should be and arranged him in imaginary worlds. That is merely to leave the dead horse on the ground—reality too difficult.

Between the apologist and the radical there is full agreement, save only as to what should be done in view of the accepted facts. Having examined wealth, idleness, poverty, the uses of capital and the frustrations of human happiness, the apologist has said, "Such is the economic law. The law is implacable. Let things be." This is the celebrated doctrine of *laissez faire*. The radical has amended this to say, "Such is the law of capitalism, and that law is implacable. Therefore destroy capital."

Counsel of flight. Counsel of do nothing. Counsel of destruction. Make the economic life over by legislating a fantasy; let it be and endure its evils; abolish capitalistic society and save the people from doom.

Such were the ways of thinking about it that followed industrialism from Europe to this country. The first fruits here were European fruits. Climate did nothing to change them. The economic history of the last third of the nineteenth century is the memory of an American nightmare. All that is new began when the collective American mind, with its passion to alter the sacred circumstance and see then what will happen, its gift for seeing only the thing itself and its preference for any practical solution that will work, began freely to act upon the phenomena of industrialism.

There is no natural law of capitalism any more than there is a natural law of voodooism. Capital does not occur in a mysterious manner, with a nature of its own. People invent it, create it, consume it, destroy it. How they create it and what they do with it is the way it works with them, and there is no other law. There was a Mosaic way with capital; it would work now if people were again like that. There is a Mennonite way with capital, there is a European way with capital, and there is an American way with capital, and it is in every case the way of people with their own. Every form of society must have an economic structure. A society of ants has that. But there is no universal law of economics any more than there is a universal law of taste or morals. How people produce, divide and consume wealth is according to their capabilities, understanding, industry and character. The formal rules and laws about it merely declare what is standard practice in that time and place, and the practice comes

first. The pyramids were built by one way with wealth, skyscrapers are built by another.

This had all to be imagined and then to be demonstrated. First of all, it was necessary to doubt a European philosophy that assumed the existence of a proletariat naturally consecrated to poverty.

III

Struggle With the Old World's Doom Book of Political Economy

The French originated systematic curiosity as to the sources of wealth and how it passes around. They were the first to realize that society must have an organic economic structure. From thinking of it, they visualized it and made a drawing to represent it—the famous Tableau Economique—with hollow columns to symbolize the different classes of society, such as farmers, who alone were productive; then the proprietors and nobles, and finally the sterile class, which included tradesmen, artisans, servants, artists and intellectuals; and among these columns were tubes in zigzag arrangement through which the flow of wealth occurred, like the circulation of blood.

The enthusiasm for this crude graph was extraordinary. Mirabeau said of it:

"There have been since the world began three great inventions which have principally given stability to political societies, independent of many other inventions which has enriched and advanced them. The first is the invention of writing. The

second is the invention of money. The third is the Economical Table, the result of the other two, which completes them both by perfecting their object; the great discovery of our age, but of which our posterity will reap the benefit."

It was a mechanism hitherto invisible that had been all the time working by itself. As they looked at their picture of it they began to think of controlling it. Then they broke into a violent dispute as to whether it was working as it should—whether what they saw happening was the natural order or a deformity of it. Those who believed with Rousseau that man by nature was good, unselfish and wise, and had been degraded by government, so that the only political problem was how to restore him to his natural disposition—these said the economic machine was working in aberration; all you had to do was to make it work as its own true nature was and the world would be perfect. Utopias began to be founded. This was in the middle of the eighteenth century. There was yet to occur the French Revolution, in which so much economic fantasia went headlong to disaster that people everywhere turned back to reality.

The French had invented an economic mode of thought; but the English founded what is called the science of political economy. Adam Smith's book—*The Wealth of Nations*, published in 1776—is the imperishable old testament of that science. It was the first work in which the economic life was treated as a system of minute activities for the most part unknown and invisible to one another, and yet all

related in a definite manner to one whole scheme. The industrial revolution now was taking place—machine craft displacing hand craft, industrialism in opposition to agriculture, division of labor, foreign trade regarded as an international division of labor, phenomena of cost, value, price and exchange —and always poverty. The wealth of the world increasing prodigiously by new means and still the ache and scandal of human poverty.

Smith's work was primarily descriptive. But running all through it was a thesis that justified the first 100 years of industrialism as a horrible paradox. The thesis was that economic institutions were of natural origin. Therefore nobody could be held responsible for how they worked. Nobody could help how they worked. It was to be supposed that on the whole they worked in a beneficent manner, like other natural things. Labor touched his sympathies. Also, he said, labor was the true source of wealth. Nevertheless, he said, there was a natural wage determined by the number of people.

"The number of people," he went on, "depends on the demand of society, and this is how it works: Among the proletariat, generally speaking, children are plentiful enough. It is only when wages are very low that poverty and misery cause the death of many of them; but when wages are very high, several of them manage to reach maturity."

That is to say, the wage rates regulates the supply of proletariat.

"It deserves to be remarked," he continued, "that it necessarily does this as nearly as possible in the

proportion which the demand for labor requires. If this demand is continually increasing, the reward of labor must necessarily encourage in such a manner the marriage and multiplication of laborers as may enable them to supply that continually increasing demand by a continually increasing population. If the reward should at any time be less than what was requisite for this purpose, the deficiency of hands would soon raise it; and if it should at any time be more, their excessive multiplication would soon lower it to this necessary rate. The market would be so much understocked with labor in the one case and so much overstocked in the other, as would soon force back its price to that proper rate which the circumstances of the society required. It is in this manner that the demand for men, like that for any other commodity, necessarily regulates the production of men; quickens it when it goes on too slowly and stops it when it advances too fast."

IV

The Sacred Law of Poverty

The ox prospect for human labor! A proletariat, automatically obedient to the law of demand and supply, doomed to fluctuate between just enough at one time and misery at another. If wages provide it with a little more than enough, it over-produces itself, wages fall and it sinks into misery; when the mortality of misery has made it a little scarce, wages rise to encourage a proper supply from procreation.

It happened that Adam Smith's doctrine of individual irresponsibility for how economic institutions worked, and his remorseless theory of natural wages, perfectly suited the mentality and spirit with which Europe approached the opportunities of industrialism. The idolatry with which they were received, especially in Great Britain, is understood only on the supposition that they met some urgent need of the human conscience. On *The Wealth of Nations* as a Bible was reared a complete system of thought. It was taught in the primary schools and even in nurseries as finished truth that children ought to understand; it was expounded in the form of popular tales and conversations with young Caroline by Miss Martineau and Mrs. Marcet. Its hold on the mentality of Europe is not broken to this day. Its influence upon economic and political behavior is still powerful, if not dominant.

After Adam Smith came Malthus, with his law of population, to prove that the human race tends to reproduce itself faster than the means of sustenance can be increased; therefore inevitably, and as a natural fact, a great fringe of misery.

"The poor are themselves the cause of their own poverty," he said, simply by not refraining from excessive procreation. Thus the responsibility for poverty is passed from the ill working of economic institutions, which no one can help, to the proletariat itself.

Next came Ricardo, whose authority was great because he was himself a capitalist and able from

experience to confirm what the economists had deduced by theory. He said:

"The natural price of labor is that price which is necessary to enable the laborers one with another to subsist and to perpetuate their race without either increase or diminution."

Adam Smith had treated labor as a commodity. Here Ricardo treats it as of a race apart. He added:

"It is a truth which admits of no doubt that the comforts and well-being of the poor cannot be permanently secured without some regard on their part or some effort on the part of the legislature to regulate the increase of their numbers."

And it was Ricardo who stated it as a law that wages and profits were in direct opposition. One could not be increased except at the expense of the other, and this conflict was eternal, again like any other natural fact.

The revised and polished version of all this thinking was written by John Stuart Mill, who, from regarding with his emotions what his mind said was logically true, became a tormented pessimist, full of melancholy reflections on the futility of progress, wishing for a stationary state and wondering if life was not destined to run itself out in a quagmire. There was some heresy in him. All the laws of economics, he said, were not natural laws, immutable.

"The laws and conditions of the production of wealth partake of the character of physical truths," he said. "It is not so," he believed, "with the distribution of wealth. This is a matter of human

institutions solely. The things once there, mankind individually or collectively can do with them as they like."

Such a thought about division was heretical; it was socialistic. But it was not serious, really, and did no damage to the fundamental thought that governed European industrialism, because at the same time he was, within that thought, sound as to wages. It was he who formulated in a final manner what the socialists have ever since called the brazen law of wages. Natural wages, in the long run, he said, were determined, as the price of everything was determined, by the cost of production—by the cost of producing the human worker. And the famous limited-wage-fund law he stated thus:

"Wages depend on the proportion between the number of the laboring population and the capital devoted to the purchase of labor, and cannot under the rule of competition be affected by anything else."

What did an emotional heresy about division matter when at the same time he proved by logic that wages, representing labor's share in the total product of wealth, were twice limited—once by a natural price which was nothing else than the cost of producing a laborer, and again by a rigid wage fund? He was himself distressed by the implications. The only means of amelioration he could suggest were, first, to increase the wage fund by saving, and, second, to limit procreation. When the socialists retorted that from the natural wage as he defined it there was nothing to be saved, and that his other means meant condemning the laborer to celibacy, he

recanted and withdrew his theory. This produced a great sensation in the world of respectable economic thought. But on reflection he felt obliged to put it back, because it was logic, and he did put it back, wishing it were not so. There it is.

In the industrial countries, or in those destined to become such, especially Great Britain and France, government very easily accepted the thought system founded on Adam Smith, because it cancelled moral responsibility. The economic affair was governed by natural law. No one could change it. The less it was meddled with the better. The play of individual self-interest was triumphant. Each for himself and none for all. Sentiment, the humanitarian impulse, a feeling for the poor, socialness—these were attributes of the emotional nature. The economic man was in that aspect another animal; the only way he could act was for his own, by a natural principle of selfishness.

And for a while it did seem that this was the régime required for the development of industry in its new form. It flourished amazingly. Appeared the great centers of production, such as Manchester and Birmingham in England, Lille and Mulhouse in France. Wealth increased in a fabulous manner, with a concentrating tendency.

But where was the prosperity?

There was much more wealth. That was evident to all senses of measurement. There was more poverty, too; or, in any case, the spectacle of it was more terrible. Misery, like wealth, was tending to concentrate itself in a few places and thus all contrasts

were intensified. Magnificence and high profits on one hand, for the few; on the other hand, low wages, long hours, squalor and wretchedness for the many —for the proletariat as a race apart. Conditions became so bad that the manufacturers themselves became alarmed lest the growing generation should become hopelessly enervated under the strain of exhaustive toil for sometimes as many as fifteen hours a day, and insufficient nourishment at the end of it.

What could they do? They were not responsible. Such was the economic law, including the law of wages—the law that wages must vacillate between just enough and not enough to sustain life, for that was the natural price of labor.

Sensitive natures began to rebel. There arose socialists, communists, anarchists, mystics like Renan and moral judges like Carlyle, all saying the economic life was abominable.

Beneath the visible tragedy that moved them was another in which they themselves were involved unawares. This was a tragedy of the mind. One spell worked upon Utopians, radicals and conservatives alike. They believed the same things, held among them a common delusion. That is to say, they regarded the evils complained of as inherent in the nature of economic institutions, inevitably proceeding from the natural laws that governed them.

The Utopians, seeing how industrialism worked, and being unable to imagine its working in any other way, pleaded with people to forsake it. Seeing how competition worked, and unable to imagine any other

principle of competition, they preached coöperation. Seeing how private capital worked, and with no intuition that it could work differently in a capitalistic state of society, they embraced communism.

The radicals, believing with the conservatives that there was an eternal conflict between profits and wages, demanded that the wage and profit system be abolished. Believing with the conservatives that in a capitalistic state of society, owing to that eternal conflict, there was bound to be a proletariat doomed to poverty, they advocated the overthrow of society.

This is finally illustrated in the case of Karl Marx, the great Buddha of radicalism, whose name for more than half a century has been a terror to European capitalism. He did not attack the economic law as it was founded on Adam Smith. He agreed with Smith, Ricardo and Mill. What he undertook to do was to push the law to its ultimate conclusion, as no one else had dared to do. Not only would he prove that such was the law of capitalistic society and capitalistic production; by the same pure logic he would prove that the law was implacable. This the others had not proved; they had assumed it. In a surprising manner Marx avoided the discovery that the law was false. The spell saved him from that pitfall. Two or three times he seemed to glimpse it or suspect it, and each time he put a mark there. For, of course, if he had stumbled into it his whole thesis would have fallen.

What he thought he had proved was that the same necessity obliging capitalistic society to exploit the proletariat equally obliged it to destroy itself. The

rich would become richer and fewer and the poor more wretched and numerous, until at last the proletariat at one gulp would swallow up the rich.

"What the bourgeoisie"—the capitalistic middle class—"produces above all," he said, "are its own gravediggers."

Thus, under the law, the doom of the proletariat was poverty, but the doom of capitalistic society was death. In his calm moments he seemed quite indifferent as to when or how the fate should fall—whether by an act of violence or by a simple declaration of the fact accomplished. Most of his followers, few of whom are capable of understanding his process of logic, construe him to prefer class war in its violent aspect.

The whole drama of European industrialism was like a dream to which no one had the key. In the physical dimension appeared and reappeared a kind of reality that was mistaken for a mirage. That was the phenomenon of overproduction, causing panics, periods of frightful depression and unemployment. The first occurrence of this kind was in 1815, when the British merchants and industrialists found themselves with more goods than they could sell. Their own people had no reserve buying power because the natural wage had held them to the barest necessaries of life from day to day; and the Napoleonic Wars had left the world at large in a low economic state, so that the export market failed. The next crisis was in 1818. There was another in 1825.

Every few years this thing occurred—overproduc-

tion and poverty at the same time, too many goods and nothing to buy them with.

The economists, as you might suppose, assumed the existence of a natural law for this contradiction. The recurrence of crises suggested periodicity. The word "periodicity" suggested "cycle." If you could see it all in one heap, you would be astonished at the extent of the profound literature on cycles in business. One eminent economist traced the natural law thereof to sun spots and wrote a book to prove it. If sun spots caused industrial depressions, overproduction and unemployment, then, of course, it was God's business. Economic institutions were not to blame; again, nobody was responsible.

Why did the economic thought of Europe assume this false fatalistic shape? One is obliged to ask that question. Why was industrialism in Europe accompanied by a logic that proved always its limitations—a natural wage just above the line of misery, a proletariat whose lot could not be mitigated, a perpetual conflict between profit and wages, a remorseless law of capital, the utter impossibility of diffusing prosperity in a progressive manner?

The answer is, if they could persuade the mind to prove these things, then their scheme of human relationships was justified. Their thinking was rich, but their traditions were fixed. All the reasoning with which they proved to themselves a false economic case was but a dialectic, and beneath it was a social assumption that could not be proved. That assumption was, and still is, that a certain structure of society is ordained and natural, a caste struc-

ture, one caste to labor, one to contrive and one to enjoy—the lower, the middle and the upper classes. Thus, class warfare in the Old World, now taking its images from industrialism and employing the language of economics, is simply the ancient social struggle among those three classes. Industrialism intensified it, principally by massing the political power of the lower class.

Industrialism did not create the proletariat; it did not limit the prosperity of the proletariat. It was proletarianism deep-rooted in the Old World system that limited the tremendous social significance of tools and methods whereby for the first time in the history of mankind there is the feasibility of great plenty.

V

The Thought That Overthrew It

It must now be fairly clear why the book of economics that we received along with industrialism from the Old World did not belong here. In the first place, it defined limitations, and we disbelieved in limitations. In the second place, it was designed for and took to be forever granted a social structure that did not exist here. That is to say, industrialism as we received it was founded on a foreign philosophy, one that we had definitely rejected in the Declaration of Independence. It was one of two things that could happen. We had either to change our social philosophy or change the meaning of industrialism; and for a long time, half a century at

least, there was doubt as to which would happen.

It was an American, Francis Amasa Walker, in 1876, who prepared the destruction of the two disastrous foreign theories, namely—that there was a natural wage for labor, meaning the bare living wage, and, that profits and wages were in perpetual conflict.

What did it mean that among competitive industries it often happened—as a rule, it happened—that the one making the highest profit was the one that paid also the highest wages? This invariably turned out to be the most efficient industry of its kind.

Thus, it occurred to him that wages need be limited in fact only by the productivity of labor; and as for profits, it occurred to him that "Under free and full competition, the successful employers of labor would earn a remuneration which would be exactly measured, in the case of each man, by the amount of wealth which he could produce with a given application of labor and capital, over and above what would be produced by employers of the lowest industrial or no-profits grade, making use of the same amounts of capital and labor."

Therefore profit was not that horizontal charge upon production which the European book of economics said it was. Profit, above interest on the capital employed, might be pure surplus, a plus quantity altogether; that is to say, it might be an actual increase in the production of wealth from better methods and higher skill, with only the same amount of capital and labor as before. So wages

and profits were limited not by each other at all, but only by the productivity of capital and labor in collaboration.

These ideas, though now so familiar among us, were at that time strange. We did not copyright them. They were free to the whole world. But it was only here they took root. They grew slowly at first, and more slowly in the gardens of economic theory than in the testing grounds of experience. In notable instances they were proved by results. Their implications enlarged. Then suddenly they put forth their strength and overthrew the European book of economics.

This, you see, was their native soil.

CONFLICT

I

Native Ways of Feeling

WHAT is a way of thinking? Thought may be feeling rationalized; feeling may be thought emotionalized. A way of thinking will not move people until it has become also a way of feeling.

It was a characteristic way of American thinking that overthrew the fatal dogmas imbedded in the European book of political economy—the book received in this country along with the forms of Old World industrialism.

The first and most disastrous of these dogmas was the brazen law of wages. Such was the term fixed by socialists upon the economic doctrine that there was a natural wage, or a natural price for labor, just above the line of misery, for if wages were more than this the proletariat would multiply too fast, thereby increasing the supply of labor and breaking the price. Another form of the same dogma was the doctrine of a limited wage fund. The total of wages that could be paid was determined by the amount of capital available for the purchase of labor—the wages fund—and this fund could be increased only by capital savings from the profits of industry.

Then the second dogma, namely—that profits and wages were directly opposed in natural principle. Neither could be increased but at the expense of the other. Therefore profits, from which the

wage fund was derived, could not be increased without reducing wages to begin with; if, on the other hand, wages were increased, then profits were diminished and the wage fund was impaired. Secondly, if wages for any reason increased above the needs of bare existence, then the supply of labor increased by procreation, with again a disastrous effect upon the price of labor.

Thus, from the operation of what was believed to be a natural economic law, a proletariat doomed to exist outside the pale of prosperity, with no sense of participation in the increase of wealth, no strength of its own but the strength of despair.

Old World industrialism under the tyranny of this way of thinking became a menace to society; and if the state, acting on motives of both fear and humanity, had not interfered to provide out of the public funds such minimum decencies of environment as the proletariat was unable to buy with its natural wage, industrialism would have become a menace to the human race.

In this country occurred a revolution of thought. The American doctrine is that capital, profits and wages are limited only by production. If there is any law to limit production, we have yet to discover it. Therefore, so far as we know, prosperity is unlimited by any inherent fact. What we did discover, however, was that production could be limited by a state of feeling.

Leave capital and profits to come back to; take it now simply as to wages. More than fifty years ago an American economist definitely formulated

the thought that wages were unlimited save by the productivity of labor. This was a vast seed, containing the complete principle of economic deliverance. Yet it did not immediately transform American industrialism.

Why was that? And why was Europe, whose economists took this American seed and examined it critically—why was Europe unable to grow it at all in the soil of Old World industrialism?

The answer to the first question is this: We perceive that wages are limited only by the productivity of labor. To increase wages in a progressive manner you have only to increase the productivity of labor per man in the like manner. Very good. But how are you going to increase the productivity of labor per man or per man hour? You may put in the hand of labor a tool more powerful and cunning, you may devise a science of motion, you may impose the perfect method; but if labor is dark at heart, if it is hostile or secretly disbelieving, still production will be limited. You may promise that the effort of willing collaboration shall be rewarded by higher wages, you may offer the wage beforehand; labor has heard all that before and has been many times so tempted to drive itself.

You see what has happened. Labor has accepted the old employers' law of conflict between wages and profits in principle. It has organized itself against the despair implicit in that law, against an industrialism that treats labor as an impersonal commodity; specifically, it has bitterly organized itself to limit the production per man per hour in order to

make more jobs. Suppose, it says, that for greater productivity you did pay higher wages. That would mean fewer jobs, unemployment, then two men running after one job everywhere and ultimately lower wages than before.

So, notwithstanding the liberating thought, the better machines, the more scientific method, production is still hindered. It is hindered by ways of thinking and feeling on the part of labor, and what labor thinks and feels is inevitable from the way of thinking that has hitherto governed industrialism.

There is the last *impasse*. No thought, merely as thought, has the power to break it. The thought might lie for centuries on the shelf of abstraction. It contains the mystery of fecundity; to germinate, it requires to be buried in the ground of common feeling. It must grow downward into feeling and become emotionalized; it must appear again on the plane of thought as feeling rationalized. Then it becomes dynamic. That takes a length of time.

As to the second question, why the American idea that wages were limited only by the productivity of labor was a seed that could not germinate in the ground of Old World industrialism, the answer is that it was alien to a social philosophy assuming the natural existence of a proletariat in a condition disciplined by poverty and fear of want.

There was all the time a characteristic way of American feeling. In the struggle between industrialism as it was in the 70's, 80's and 90's of the last century, and the old Puritan expectation that economic and social motives were to be reconciled,

it suffered many defeats. At crucial moments it appeared to have lost its vitality. The early success of industrialism as a heedless force so offended and mocked it that some of it had turned away, finding refuge in cults of mortification. Much of it had been overwhelmed by the alien flood. This was the immigration that began about 1870 and continued for forty years. Regarded merely as a movement of humanity from one world to another, it was of epic proportions. Regarded from the traditional American point of view, it was catastrophic.

These were not such people as had been coming before, self-selected out of the ancestral stock. They were new people racially, and would be perhaps much more difficult to assimilate—some 25,000,000 of them in four decades, added to a population that was less than 40,000,000 when the inundation began. Generally their social emotions were class-conscious. They preferred the industrial centers and either regarded themselves as wage slaves or responded to that view of their condition when it was presented to them by demagogic leaders. For this was the Old World proletariat, bringing its feelings with it.

American industrialism, be it said, treated it as such; and the human spectacle in the environs of large production became even worse than it was in Europe, because here the material was polyglot, with nothing more in common than fear of the police, hatred of the boss and a sense of oppression.

Thus, industrialism in the European meaning, governed by Old World dogmas of political economy, was continued here long after that event of

thought which was sometime to transform it, simply by reason of having this enormous and endless supply of cheap labor that bred itself in Europe and migrated hither.

Industry then had no ethical or social ground, no technic of justice. As an assertion of pure will, untamed, neither moral nor immoral, it had an aspect of grandeur. The scars of its infliction were deep. Americans who lived by their hands were engulfed and suffered with the aliens. The words that follow are those of an industrialist, Henry S. Dennison, president of the Dennison Manufacturing Company, and now a director of the American Management Association:

"There will be an underlying suspicion for one full generation after employers have for the most part been square and wise. The tales to-day's workmen heard their fathers tell at the supper table set their subconscious attitudes."

II

The Economic Secret Is Human

But a certain way of feeling was implicit in this foundation. The war was its powerful reagent; and if the passion then and afterward to Americanize alien things did seem often unreasonable or intolerant, that was only the surface tension, the zeal that goes to waste in any great motion of the human spirit. Those who sneered at 100 per cent Americanism, crude and ugly as the phrase was—Americans who sneered at it—were those who had gone so

far in contempt of their own that they did not know what the word "loyality" was a touchstone of.

And what was it a touchstone of? Particularly, what does one mean by a way of feeling, native here, that could liberate the forces of production?

First, you might look. Glimpses of its effect on human behavior are everywhere familiar, only that we take them too much for granted and so miss the essential impression.

As a traveler by rail, you must sometime have seen the official train go by—one or two Pullmans and the president's private work car. And have you noticed how it is saluted by the men on the ground—yardmen, train crews, even section gangs out on the right of way? They all make one gesture alike. It is a free, wide sweep of the arm, with this interesting peculiarity—that although it takes form suddenly as a reflex action, it ends slowly, instead of snapping out like a military salute.

Its character as human expression lies in that difference. The power that sustains it in space for one more instant at the end of the arc—what is it? You do not see, perhaps, that the men on the official train—executives, managers, superintendents, the president himself—are continually making that same gesture, no matter what else they may be doing or thinking. Sometimes they make it first, sometimes they see it first; that is by chance. The gesture asserts nothing. It is to and from all manner of men alike and yet is no assertion of their equality. To assert equality is puerile, as we know, for if it has to be asserted it does not in fact exist. The ges-

ture is a sign of something they all know, and seals it silently.

As a refugee, a reporter, almost any kind of person, you might have been on a train that had waded miles through the Mississippi River flood, the train crews out ahead of the locomotive using poles to make sure the invisible track was still there; you might have noticed that at the end of the journey Secretary Hoover went forward and talked with the engineer. As Secretary of Commerce in charge of relief, it was his job to know more than anybody else about the flood. What he said to the engineer was to this effect:

"I hate to think what would have happened to this country without your railroad and its gang. I'm going to tell your president what I think of it all."

"He's doing a good job, isn't he?" said the engineer, adding the railroad president's surname.

"He is," said Mr. Hoover. "But I'm thinking particularly of the way you pulled us out of the water today with this train."

"That's my job," said the engineer.

That is all there was of it. Still nothing asserted. Values implicit. His job, the gang's job, the general manager's job, the president's job, and that one fine gesture as their common sign.

As one pursuing the economic theme, you might come to the great steel plant at Gary. Here is the latest word in steel making. The operation is so large that you have to see it from an observation car attached to a yard engine. The superintendent says

it may take twenty minutes to get the car up. While you were waiting, would you like to see the town?

See the town! It is a steel town. Only a few years ago you were expected not to see a steel town. Nobody mentioned it. Everybody took it somehow to be hopeless. Steel workers would live like that.

"We can hit the high spots and be back in twenty minutes," says the superintendent. Putting a section of rail down on his papers, he starts for his hat, but turns back to his desk and pushes some photographs toward you. "That's our own beach out there on the lake shore," he says. "Some shots of our picnic last week." Steel-town people playing on the sand! You recognize the superintendent among them.

"Oh, yes," he says, "the executives go along. Those two kids right behind me—no, the other one, there—they are twins. That's the mother. They did have a time of it. Look all right now, don't they?"

The modern word in steel making. The works a standard of wonder. Yet before the works you must see the town, and before seeing the town you must take a minute to look at photographs of the all-hands picnic on the company sands, which illustrate, besides many things, that a certain Slav woman's twins, notwithstanding the time they had of it, are looking very well.

Later, in the works, when you see men in small thoughtful gangs minding volcanic energies, releasing tides of power, controlling by means of tiny levers machines that cause tremors in the earth as

they go in and out of motion—then you remember the town and you understand how important it is that steel people should have nice houses, parks, playtime, freedom from all unnecessary anxiety.

You remember the twins and make a relation. If, in the act of putting a million-dollar piece of mechanical equipment into a motion, a man were to be seized with a panic about his twins or by a bitter reflection on the wretchedness of their surroundings, he might jam the works quite without meaning to do it. Or if he had meant to do it, you would never be able to prove it. The hand slipped—that was all.

Leave out the slip. There is no visible accident. There is only the difference between a hand that is willing, always pressing for the optimum result, and a hand that is slack or heavy because the mind behind it is sullen, cares nothing for the ideal output, or means deliberately to retard production in order to keep more men on the job. When by means of mechanical equipment you have multiplied the power of the hand a million times, so you have multiplied this difference a million times, and it becomes enormous.

The more your investment is in machines, the greater your stake is in the man who touches them, in his general well-being, his manner of living, his conscious and unconscious attitudes. You see clearly what the head of the United States Steel Corporation means when he says the true problem of modern industry is how to gain the loyalty, the coöperation and the understanding of the individual man. Not men in general—the man. And there is new mean-

ing in a saying you will hear very often among industrial managers:

"The better the coat a man wears to his job, the more he is worth to industry."

Suppose you come to a motor town. It may be Flint, where the General Motors Corporation, organized somewhat like a federated government of free states, has several automobile companies, all competitive as to product and method, each one possessing state rights of which it is very jealous. The governor of one of these state jobs is a man who eats drop forgings as an after supper delicacy. He handled machines before he could reach them from the floor, and the drive boss of old industry was his childhood nature study, from the point of view of those who were driven.

He is talking when the personnel man walks in, and stops to introduce him. Everywhere, in everybody's office, the personnel man. What does it mean?

"I'll tell you," says the governor. "It's 90 per cent bull." He grins as he says it, and the personnel man grins too.

The governor goes on with what he was saying. The man he keeps going around looking for rough spots had said to him the frame riveting job was bad in any way of looking at it. The hot rivets—one man to slip them into place, another to hold them, another to set them. A mean job; nobody liking it. The trouble was no one could think of a way to do it in a neat automatic manner.

The governor had said to him, "You've got a

new job from today. Don't do anything else, don't think of anything else, until you find a way to change that operation."

And they were now about to change it. The little thing to change it with was that—standing there in the middle of his desk—a new automatic tool. When you have admired it, he takes you to see what he thinks is the finest foundry in the world. No dirt, no dust. Do you know what a foundry used to be?

On the way, as you are entering the works, he says suddenly: "No man in this plant can be fired by his boss. I can't fire one myself. The most a boss can do is to suspend a man and send him up to the personnel court for trial. No boss can fire a man. Do you get that?"

Along with it, lest you should forget it, you receive a half-ton hydraulic thump in the ribs. Recalling what he said ten minutes before on the meaning of personnel work, you perceive that such was levity—his way of punching the personnel man in his ribs.

"Well, what do you think of that foundry?" he asks.

You tell him it is fine. Only at the shakeout—that's a little bad yet. The governor is terribly let down.

He says, "Now, of course, you would notice that, wouldn't you? It's the one damn bad spot we haven't ironed out. But we're on it."

Almost the last place you might think to look would be in the clothing trade, with the traditions

of feud and discord that belong to it; and for the reason, moreover, that because the machines must be small and individual, the industry would seem not to present big opportunities for increased productivity per man by scientific management on a machine basis. Nevertheless, in any one of the so-called x-production shops in Chicago where the union of Amalgamated Clothing Workers of America has been developing the principle of collaboration you will see a new thing. The production manager representing capital meets the production manager representing labor—meets him on the floor in the open shop—and asks, "How's it going?"

The production manager representing labor says, "Here and there a little piling up. Nothing we can't move. Look around."

From opposite sides they come to common point of view. The work goes at high speed, payment is by the piece, production is intensively intended, and yet the rhythm is spontaneous and self-sustaining. Wages are good—eighty cents to a dollar an hour for men and women together—and the costs are low.

This is a case in which the intelligence acted first, the feeling ensued. Notoriously, it was a sweated industry, wages low, hours long, conditions wretched. Union thought was generally radical, imbued with the idea of class warfare, learned in the Old World. If once the workers by militant solidarity could get physical control of production, then they would be able by extortion to take all the profit and thus destroy the institution of capitalism, with its wage

slavery and other horrors. The result of warfare in that character was unexpected. The more it won in a particular case, the more it lost in principle.

The industry began to shrink in cities where the union's power was, notably Chicago, and at the same time to expand very fast in the nonunion fields. Then a light broke on the union leaders and they acted with shrewdness. First they made a thorough economic study of the situation in order to be able to show their own people that their problem was to defend the union field. This they could do only by collaboration with capital.

Then they put their cards face up on the table and said to the manufacturers in Chicago, "What labor cost must you have to meet your nonunion competitors in Baltimore?" When the figure was arrived at they said: "Union labor will undertake to produce garments at that cost. This we propose to do not by cutting wages; we will reorganize the work on a scientific plan and at the same time we will superintend ourselves. While to do that will cost us nothing, it will relieve you of a large expense."

Next they went to their own people, saying: "The trouble is there are too many of you on this work—too many cutters, for example, jealously guarding obsolete craft rules, such as refusing to cut two colors or more than a certain number of pieces at a time, thereby limiting production simply in order to make jobs for cutters. To reduce the labor cost of garments we have got to increase pro-

duction per man. Unless we do this, the garment industry here will perish."

The cutters were the aristocrats; they held the keys of production. But the survival of the union and of unionized industry was of more importance than jobs for cutters. In one case 200 of them were removed from the industry by edict of the union. The industry had agreed to give each cutter $500 of farewell money. Some of them went to other cities, some bought taxicabs, some were presently received back into the shops from which they had been expelled, because now, with lower labor costs from increased production per man, though wages were higher than ever before, the industry began at once to expand. The Chicago manufacturers were able to make headway against their competitors in the nonunion fields.

This had been a body of labor, nearly all of recent European origin, emotionally fixed in the fallacy shared by Old World radicals and conservatives alike that profits limited wages and that the conflict between them was by a natural law of capitalism. Therefore, from labor's point of view, the only way to increase wages was to force capital to surrender more of its profits. It has learned the American doctrine.

What limits both profits and wages is high cost. The manufacturer is not interested in low wages at all; he is interested in low costs. And where capital and labor collaborate to increase production per man per hour per dollar of capital invested,

there you may have the phenomena of low costs, high wages, high profits.

But what you are to notice particularly in these x-production shops of the Chicago clothing industry is the effect of this experience on the state of human relations. There is no fear of the drive boss; there is no drive boss to be feared. There is no change in the rhythm of activity as the production manager representing capital comes and goes. The workers set their own pace. They have a collective sense of responsibility for a total result and a method of their own with the slacker. The object is that the cost of a union-made garment shall be so low that it may compete with one not union-made. They have for the same reason a collective sense of responsibility for the quality of the work.

It will start a train of speculation to imagine that here, perhaps, in the midst of modern industry, is the reappearance of the ancient pride of guild.

The Amalgamated Clothing Workers of America, as a body, now is rich. It has a big bank in New York, runs an investment trust on sound economic lines and has loaned as much as $300,000 at a time to manufacturers in the union field whose business it could save by willing to save it. Seeing all this, the extreme radical left wing of labor from which the Amalgamated Clothing Workers departed has only one thing to say. These people have embraced capital. The union itself has become capitalistic. Quite so. It works that way.

The four industries touched in these glimpses—transportation, steel, motors, clothing—are very

dissimilar. From the point of view of an engineer thinking to act upon them by extensions of method and agencies of power, they would seem to present unequal possibilities. And yet the force that does truly release human energy may act upon all of them alike. It must occur to you that the ultimate secret of American production lies neither in scientific method nor in the multiple use of mechanical power. You might have the perfect method and the very finest equipment, but without certain ways of thinking and feeling, from the office of administration down to the gate, you would not get the fullness of production.

III

Discoveries in Understanding

Scientific management as a way of thinking originated in a way of feeling. By an accidental path in the year 1880 a genius named Frederick W. Taylor appeared in American industry, in the guise of machinist and pattern maker. Partial eye failure had turned him from a career in law. He learned this trade instead; and then having finished his apprenticeship, he began as a day laborer with the Midvale Steel Company. Presently he got a lathe job, and shortly after that he was made gang boss in charge of lathes.

As a lathe hand he had done as the others did. He had limited his output to about one-third of his own and the machine's capacity. Such was the universal practice of labor—called in this country sol-

diering, in England hanging it out and in Scotland cacanny. It was more than a practice; it was a principle of behavior enforced by the group on the individual as an ethic.

A man who would let himself go was disloyal to his craft. The ground of it was fear—fear of injustice and fear of unemployment. If pay was by the day, the lazy and the industrious received equal reward. That was unfair. If pay was by the piece, the fast worker was a rate breaker. This was so because employers treated the piece rate not as the true value of a given unit of work performed but as a price for labor as labor. If men exerted themselves more in order to earn more, the rate was cut, for no reason other than they earned too much, or more than labor was worth, quite regardless of the value of what it had produced.

What was too much? Anything more than the prevailing wage. A manufacturer who permitted his workmen to earn more than the prevailing wage was said to be spoiling the labor market and was liable to be treated by other manufacturers as in the factory other workmen treated that one who let himself go. The prevailing wage, of course, was a term to express the Old World idea of a natural wage—a sustenance wage—having no relation whatever to the productivity of labor at a given time and place. Thus, labor limiting output because the employer limited wages, and both together in this antagonistic spirit limiting the power of plenty.

When Taylor was made gang boss the men with whom he had soldiered on the lathes said, "Now that

you are boss, you are not going to be a piecework hog, are you?" That was to ask if he intended to demand a greater output. Their experience was that greater output meant inevitably a cutting of the rate.

His sympathies were with the men, then and always afterward. His duty was to the management. He said he was going to get more out of the lathes. That was his job. They said he would see; and there was the beginning of a kind of fight that was chronic throughout industry between the drive boss seeking to increase production and the workmen resolved to limit it.

Taylor tried persuasion; he tried to drive them. He trained some young men to handle lathes as pacemakers, under an agreement beforehand not to limit output; but they were no sooner competent than they went over to the other side and soldiered like the rest. Then at last he did deliberately break the piece rate so that to keep their wages up they were obliged to produce more. Their retort was to break the machines, always in some ingenious manner to prove it was the speed that did it.

This was the point at which the management, as the men knew, was always ready to give up the fight. Taylor had warned his management that this would happen. It was the workmen's last weapon. The management stood by him. Then he fined the men for machine breakage, no matter what the cause was. The roof might fall and break a lathe, but the lathe man had to pay. At that the men gave up, and agreed to do a fair day's work.

Telling of that fight before a committee of Congress years afterward, Taylor said: "It took three years to bring this about. I was a young man in years, but I give you my word I was a great deal older than I am now with the worry, meanness and contemptibleness of the whole damn thing. It is a horrid life for any man to live, not to be able to look any workman in the face all day long without seeing hostility there and feeling that every man around is his virtual enemy."

Out of that feeling grew the thought of scientific management. Taylor identified clearly the two radical problems.

First, industry had no means to determine precisely what a man's output ought to be; therefore it did not know to begin with what was a fair day's work.

Secondly, between employer and employe there was a bankrupt relationship, with so much suspicion, unreason, wrong thinking and bad faith on both sides that collaboration was impossible.

In both dimensions it was production that suffered.

To the first problem there was obviously a scientific approach.

Power machines had replaced hand tools, all the conditions that governed production had changed, and yet trades were still taught and learned as in the Middle Ages. The journeyman carried the knowledge in his head and imparted it to the apprentice by demonstration. The way the journeyman said to do it—that was the way. The speed the

journeyman said was proper—that was the speed. None of the knowledge in the journeyman's head had ever been submitted to analysis or scientific study. Nobody knew, for example, the ideal speed at which a lathe should turn for any certain kind of work, not even the lathe makers. It was what the journeyman said. Machines were a triumph of precision; handling of them was by the old journeyman's rule of thumb.

He could not be expected to make a scientific study of his job. He had neither the time nor the means. Beyond his skill at lathe work was an art and science of cutting metals at high speed, and this could be discovered only by research, experiment, patient observation of fact, time measurement of motion and then scientific imagination acting upon the data. And there was perhaps no kind of job that did not contain in itself the materials of an undiscovered science.

To prove it, Taylor undertook to develop a science of shoveling. This experiment took place in the yards of the Bethlehem Steel Company, where there was a shovel gang of 600 men. All using the same type of shovel, they would go from a pile of rice coal, of which a shovel load was three and a half pounds, to a pile of ore, of which a shovel load weighed thirty-eight pounds. His assumption to begin with was that somewhere between these two extremes there must be an ideal shovel load—that is, a load at which a given amount of physical effort would move the greatest quantity of stuff. Two pairs of first-class shovelers were found willing to

submit themselves to observation and training. They shoveled all day, the shovel loads were accurately counted, the pile they had shoveled was weighed. The weight divided by the number of shovel loads gave the average load per shovel, and it was, say, thirty-eight pounds. The next day the shovels were shortened to hold only thirty-four pounds, and at that average load, with no greater exertion each man handled thirty tons, where the day before he had handled only twenty-five tons. The amount handled per man increased as the shovel was further shortened, down to a load of twenty-one pounds; the amount handled per man decreased as the shovel load was reduced below twenty-one pounds. Therefore twenty-one pounds was the ideal shovel load, provided the lift was not more than five feet, the throw not more than four feet.

Next the difficulty of suiting the shovel to the material. It takes a large shovel to hold twenty-one pounds of rice coal; a small one holds that weight of ore. So now various types of shovels must be issued out of a tool shed as the men come to work, and the work must be planned ahead so that the right number of men will get coal shovels and go to the coal pile, or ore shovels and go to where the ore is, and so on.

Moreover, there were many wrong ways and only one right way of driving a shovel into refractory stuff, like ore—a way of transmitting the weight of the whole body through a locked forearm. The difference between the right way and any other way might be eight or ten tons a day in the quantity

handled per man, with much more fatigue at the end. This had to be demonstrated, even to the first-class shovelers.

The result of putting shoveling on a scientific basis was that 160 men, working no harder, did what 600 men had done before.

To determine the exact conditions under which a unit of human effort will produce the maximum result is purely a scientific task. Then you may know what constitutes a fair day's work. But how are you going to get it when you know what it is? That is where the second problem begins. Suppose labor declines to accept the scientific norm. Suppose it says, as it reasonably may, that wages should be determined by the result, not by the effort. Though the effort be less, still for the same wages as before it will produce the same result. Then what?

With all your knowledge, you are practically where you were before. You may know how 160 shovelers working no harder, only more scientifically, may accomplish as much as 600 working in the old way; but you will not get the result until the most scientific gang of shovelers in the world is also the highest paid gang of its kind. Such was the case with the Bethlehem Steel Company's shovel gang. The two basic conditions of scientific management were realized. Hence the importance of that experiment in the early history of the Taylor movement.

One of Frederick W. Taylor's perplexities was to find the right name for what he meant. He

never did find one. Scientific management—that name—though he adopted it in place of Taylorism, emphasized exactly what he kept saying it was not. It was not efficiency, it was not any mechanical device for increasing the man's productivity, though, of course, the means were necessary.

"In its essence," he said, "scientific management involves a complete mental revolution on the part of workmen toward their work, toward their fellow men and toward their employers. And it involves the equally complete mental revolution on the part of those on the management's side—the foreman, the superintendent, the owner of the business, the board of directors—toward their workmen and toward all their daily problems; and without this complete mental revolution on both sides, scientific management does not exist.

"The great revolution that takes place in the mental attitude of the two parties under scientific management is that both sides take their eyes off the division of the surplus as the all-important matter, and together turn their attention toward increasing the size of the surplus until this surplus becomes so large that it is unnecessary to quarrel over how it shall be divided. They come to see that when they stop pulling against one another, and instead both turn and push shoulder to shoulder in the same direction, the size of the surplus created by their joint efforts is truly astounding. . . . Scientific management cannot be said to exist until after this change has taken place in the mental at-

titude of both the management and the men, both as to their duty to coöperate in producing the largest possible surplus and as to the necessity for substituting exact scientific knowledge for opinions or the old rule of thumb or individual knowledge. . . .

"I say that any set of men who want to earn a big profit in any industry must have that change of mind. If they want to get a big profit, they must have that view. You cannot keep men working hard on one side and not have them work equally hard on the other side. If you want a profitable business, you cannot have meanness and injustice on one side or the other; you have got to eliminate meanness and injustice from both sides."

From a characteristic way of thinking had come the American theory that wages were limited only by the productivity of labor and that profit in the highest sense might be pure surplus—simply more wealth produced with the same amount of labor and capital as before. Here in the words of Taylor is the translation of theory into the language of a working principle.

It is feasible to conduct industry by a rule of dogged conflict. Fear of want will keep men at work; necessity will oblige capital to employ itself. It is not possible by that rule to have prosperity. The surplus above a sustenance wage for labor and a rate of interest for capital—that plus quantity out of which will come high wages, high profits and more capital—simply, it is not produced.

IV

Evolution of Scientific Management

The mental revolution that Taylor talked of did not come all at once. For thirty years industry at large understood scientific management to mean getting more for your money out of labor. The production engineer appeared. There was rapid improvement in shop practice generally. "Efficiency" was the magic word. You did not drive labor to exert itself more; instead, you created the conditions under which it was bound to be more efficient; and not the least important were conditions of working environment, such as lighting, heating, sanitation, creature comforts. All this was to the good, of course, but because the vital imponderable content of scientific management was neglected, or misunderstood, many disappointments occurred. Union labor was antagonistic. Scientific management seemed always to be something that was done to labor or for it, seldom was it anything in which labor had a sense of initiative.

As recently as 1912 the proposal to introduce scientific management on government work resulted in the appointment of a special committee of the House of Representatives to see into it. At about the same time Dartmouth College arranged a conference to spread information about it. The newspapers were giving a great deal of space to the subject. Popular interest had been originally excited by expert testimony in a famous railroad rate case to the effect that the railroads were inefficiently managed

and might very easily increase their profits out of waste, with rates as they were, if they would only adopt scientific management. Much of the controversy was confusing from the fact that efficiency and scientific management were so often taken to be the same thing.

Not until some time after 1910 was it possible to recognize definitely a science of management in industry. Now one who seeks the meaning of American business, the secret of its character and the sources of its power, will be astonished at the authority and scope of that science. Management as an institution, with its threefold responsibility—to capital, to labor and to the public—has been an amazing development. It is a new science, with a new point of view, a new quality of curiosity, a new literature.

A recent bulletin of the Taylor Society, touching the extent of accumulated book knowledge, said:

"The literature of management has become so abundant that many individuals and firms are puzzled by the problem of selecting a moderate-sized library on management subjects. Stimulated by many inquiries for assistance, the society has prepared the following nucleus of a management library."

The list, merely as a nucleus, contained 124 book titles and twelve bulletins and periodicals, all on the science of management.

In the earlier literature you will find the problem of human relationship regarded as one among others, under some such head as personnel administration. Steadily the emphasis has shifted, until

now this is treated as the core problem. There is no right solution of any other problem but in relation to that one, and however you begin with that one, you come naturally to all the others.

You may approach industry from the point of view of profits and come eventually to the problem of unemployment as a natural evil. That was the old way. Or you may approach industry from the point of view of unemployment, as an economic and social disaster, and come from that direction to every other problem. To stabilize employment you have to sell what labor produces. To sell it, the product must be right, the price must be right, the cost must be low. There already you begin to touch the problems that belong to selling and production management. Then you have competition, change, seasonal rhythms, and so problems of policy, principle and general management.

How you will approach it is a matter of choice, and the choice will be determined by what is characteristic in ways of common thinking and feeling.

In 1923, when the American Management Association was formed, to succeed the National Personnel Association, which had succeeded the National Association of Employment Managers, a conviction was stated in these words:

"The association is organized on the principle that the human problem in commerce and industry is a major problem, and that personnel administration is a responsibility of the line executives, assisted wherever possible by the advice of staff executives trained and experienced in this field of activity. In

short, without in the least denying the validity of other points of attack, it approaches the study of the whole management problem in terms of human organization."

This was subscribed to by a board of directors representing such industries as the American Telephone and Telegraph Company, the Pennsylvania Railroad Company, the Eastman Kodak Company, the United States Rubber Company, the Dennison Manufacturing Company, the General Electric Company, the American Rolling Mill Company, the Miami Copper Company, the American Radiator Company and the Standard Oil Company of New Jersey.

Recognition of the human factor—such was the formal phrase—expressed itself for a long time in a variety of worthy activities comprehended in the term "welfare work." The common weakness of much of it was that it gave people a sense of receiving from above what was benignly deemed to be good for them. That is all past. What was called welfare work is taboo by that name. In place of it is merely the good sense to provide what the civilities require, and nobody is either conscious or self-conscious about it.

Then came profit-sharing by various plans, some of them complicated, by no means all of them successful. Still something was left out. Stock ownership was a solid idea, leading as it did to employe representation. It worked out slowly. Employes of the United States Steel Corporation had been buying stock under a felicitous arrangement with

the management for more than twenty years before they quite realized the implications of joint proprietorship. That corporation now has 50,000 employe stockholders and is greatly pleased when on their own initiative they elect a representative to appear at the annual stockholders' meeting with a case to state or some observations to make from the point of view of labor partnership. This happens to be only the most notable case. The total amount of employe stock ownership in American industry is approaching $1,000,000,000.

Recently there has developed very rapidly the idea of employe representation with or without stock ownership, regarded either as a right that belongs to labor, or, if not as a right, then as a principle of relationship which the science of management finds to be sound. By employe representation is meant some form of direct participation by labor in the councils of industry.

Number 32 of a series of bulletins addressed by the American Management Association to production executives, entitled Some Major Aspects of Employe Representation, says:

"The movement is a complex of many motives. Few innovations in the field of business management have so gripped the imagination of those responsible for the conduct of American industries."

The object is plain. It is that all matters shall be made open to human understanding. Beneath the object is the subject; and how the imagination of the science of management acts on the subject

will be found at the end of the bulletin in these words:

"If it be true that the conditions of modern industrialism yield far richer experience than do the circumstances of private life, that they broaden the mental horizon and perfect the manual dexterity of the persons engaged in industry, then it should be considered equally true that employe representation is an effective means to these desirable ends. This improvement in individual quality constitutes the greatest asset any organization can have. Again, if we maintain that the first duty of the worker be to advance efficient production, should we not equally affirm that his willing consent establishes his moral claim to an equivalent reward? Such a reward beyond wages is found in employe representation. Its plan reveals native ability by providing incentives to originality and leadership. Its operation supplies contacts which illuminate the humblest task with the vision of mutual service. Each individual realizes that the successful completion of his own work depends largely on the assistance and coöperation of others."

V

Thought Is Emotionalized, Feeling Is Rationalized, and the Revolution Is Complete

Observe that a cycle is accomplished. The revolution is working. A way of thinking that took root in the ground of feeling reappears on the plane of thought as feeling rationalized. Who now is talking

of cultural values in the day's work and taking it that the meaning of the job to the man is of paramount importance? Not the socialist, not the radical, not the Utopian. It is the science of management.

At this point it is no longer so difficult to define what it is characteristic in the American way of feeling that liberates the forces of production. Anyone may recognize it. Deeply, it is an attitude toward work.

If you ask again the question why and how we escaped those evils of laborism that limit production in the European system, particularly in Great Britain, the answer is indicated. Labor here is regarded from quite another point of view.

In the Old World, in perhaps every old system of civilization, labor has been treated as a curse, to be avoided or to be endured. Idleness was the blessing. All their economic Utopias turn out to be full of idleness. It was only in freedom from work that the individual found culture and self-expression. The act of producing wealth by contact of the hand with its raw materials was vulgar, low-caste. To command and spend it was polite, high-caste.

For the American—speaking now of what is characteristic in him—all this is quite upside down. He does not know what to do with idleness. He does not understand it. Generally it kills him.

Work is not a curse. It is his soul's anxiety and the universal medium of his self-expression. To stain and roughen the hand in the creative conflict with Nature is no disgrace. There is a kind of hunger for it, as if human experience without it

were somehow incomplete. Toil leaves no stimga on the hand. The hand is free and the man is whole.

There is no surprise for us in the fact that all but three members of President Coolidge's cabinet some time made their living by use of their hands in systematic manual labor. But even in the late Labor government of Great Britain there was no such history of the hand. Here certainly for the first time in any form of industrial society the hand has been restored to full dignity. There is no intellectual class, born to that estate; there is no proletariat, born to that condition. It is neither who a man is nor how he lives that determines his social status; what is in him does. The disparities are not inherited. They are from differences of aptitude, capacity and character. What a man has in him, that he may be. At the top of the educational ladder no rungs are reserved for those whose rights are socially predetermined.

The thought that increasingly governs American education all the way up is how to equip the individual for self-expression in work. The emphasis is there, not on scholarship. It is not the function of the individual to exemplify learning; it is the function of education to discover and liberate the powers of the individual for the purpose of his own attack upon reality—for the job in life to which he is best suited. In the field of primary education the demand is more and more that the aptitudes of the individual shall be discovered. What is in him? What can he do?

It is illustrated again in the American idea of

adult education, wherein it differs from the ideas that are represented in that movement elsewhere. In England the intent of adult education is to give the wage earner a cultural interest to fill up his leisure time—nature study, astronomy, the physics and chemistry of everyday life, literature, perhaps. In Germany the intent is technical. In Denmark it is to stimulate the mind generally. In France there is not much of any kind. But the American idea of adult education is to enable the man to find greater self-expression in his job.

And now big industry, with its daily problem of bringing men and jobs together in a manner to produce the ideal result, begins to regard the individual first, because that is the better method. Formerly the idea was to analyze the job and then find the man to fit it. The job was first regarded. Now the man is analyzed. What is he suited to do? What would he like to do? Find that out and you know what he will do well. This is the highest discovery yet made by the science of management in the field of human relations—that it pays to regard the individual first. That job a man can do well, whatever it may be, is the job that will call forth his utmost productive power. And it is the job in which also he will be most content.

Inequalities are facts of Nature. They cannot be abolished. There is no evidence that men want to be equal. Certainly they have no equal taste for responsibility. What they do want is equality of opportunity to exercise their powers. Equality of opportunity was first asserted as a social philosophy.

Now the science of management gives it expression as an active principle. So at last after a long struggle in the dark, American industry conforms in ways both of thinking and feeling to the social philosophy laid down by the founders.

There are compensations. We have to give up something. As we have no caste of labor, neither have we a caste of pure learning. There are some Americans who sigh for the effect of American prosperity on the life of the mind. Many pedagogues will tell you that in fine scholarship we are inferior to the people of the Old World. They win the Nobel prizes; and that, says the pedagogue, is owing to the fact that we spread education so far and thin. And why we do that is explained in President Coolidge's great sentence: "We have staked America on the potential capacity of the average citizen."

Above a life of the mind for a few we esteem a life of richer values for the average. All the wonder of America is so derived.

KEYS TO PLENTY

I

New Time

DO you doubt that we are in a new time? The economic life of everyday reality is so strange that we have among us no proverbs about it to be smuggled into the gelatin as copy-book exercises. It is a curious fact. Life without folk maxims to summarize our kitchen wisdom. There are some that survive from another time and we keep repeating them, but they are false and serve only to illustrate what power there was in the old copy-book propaganda.

Suppose, for example, that one night everybody should come by way of a common dream to a conviction of thrift as it was taught in Poor Richard's Almanac and McGuffey's school readers; suppose that from the implanted suggestion of this dream people should begin all at once to practice old-fashioned thrift, buying nothing but what was absolutely necessary, thinking to save the rest and become rich by self-denial. What would happen?

First there would be a terriffic slump in retail trade, next a panic in Wall Street, after that, frightful depression of industry. Factories that had been producing motors, textiles, shoes, garments, radios, furniture—all manner of things that satisfy human wants—would have to close or go on short time because everybody had suddenly resolved to consume less and save more. All incomes, whether in

the form of wages or profit, would be cut down. People everywhere would be talking of hard times. The standard of living would fall. You would be lucky to have enough to live on, with nothing at all to save.

The quantity everybody expected to save was a quantity that might have been consumed; but when people all at once begin, as they think, to save it, then it does not exist. Why? Because, since they do not require it for purposes of consumption, it will not be produced.

You may say: "But what people save is money. They put their surplus money in the bank and the bank lends it to others who will use it as capital to create more wealth."

By more wealth do you mean more motor cars, more textiles, shoes, garments, radio sets, furniture, better houses, with more plumbing and modern conveniences? But as people now are minded to save their money instead of spending it, they will buy fewer of all these things, not more. Therefore why should anyone be so stupid as to borrow the money the people have saved and use it to produce more of the things the people are not buying? It would not pay.

So the seeming paradox that people may ruin themselves by saving instead of spending. It is not a paradox. It is simply true. It was not always true, and it is now true for the first time in the economic annals of the race because the problem of production has been solved. How to produce enough, even more than enough, is no longer any problem at

all. We continue to recommend thrift as a private and public virtue without realizing that when once you have solved the problem of production, then thrift universally and rigorously practiced—the kind of thrift that means doing with less in order to save more—is economically disastrous.

Why was saving ever a necessity? This is to speak of saving in the economic sense, collective thrift as a national virtue, not thrift as a form of personal providence. The use of collective saving in the economic sense—the use of it in Ben Franklin's time—was in order to create capital means to the further production of wealth. The means were more tools, machines, power stations, factories, mines, railroads, and so on. The only purpose of increasing these is to increase the production of goods that finally satisfy human wants, all precisely with the end in view that people shall be able to enjoy more, have more, exist in a state of plenty, with no necessity to stint and save and deny their wants. After many years of saving, the time may come when you have means sufficient or means in excess so that there is a potential surplus of consumable goods. Then collective saving ceases to have any merit at all. Your problem changes. It is no longer how to produce enough wealth; it is how to distribute what you are able to produce.

That time has come. In any direction you may happen to look there is a potential capacity to produce more things than the effective demand requires. It is true of lumber, coal, bricks, steel, textiles, wear-

ing apparel, food, chemicals, luxuries—whatever you like.

It was only a few years ago that the possibility of oversaving occurred to anyone as an idea. Now you may hear it discussed as a problem of the utmost importance. We must mind that we spend enough —consume enough—to keep our existing industrial machine going at ideal capacity, for unless we demand and consume what it is ready to provide, there will be unemployment, from unemployment underconsumption, and the rhythm of prosperity will break. We must be careful at the same time not to increase our power of production faster than we increase our power of consumption—careful, that is to say, not to go on adding to our capital means at the expense of our current buying power, for that is like plowing more land than you can sow or sowing more than you can reap.

You do not wear a power loom or a shoemaking machine. You want textiles and shoes. If people have already enough capital means in the form of power looms and shoemaking machinery, they are stupid to do without other things in order to create more power looms and more shoe-making machinery. In doing so they lock up their labor in excess capacity. It is no good to anyone; it is waste—waste from oversaving—because it must lie idle and is indivisible. They had done much better to save less capital and spend more money for the immediate satisfaction of their wants.

The fact is that we find it now much easier to

increase our industrial capacity than to extend the effective demand for consumable goods. The mere wishing for things does not constitute effective demand. One must want them enough to be willing to put forth the necessary exertion, and then, of course, the conditions of opportunity must be such that the exertion in itself becomes productive.

Increasingly the anxiety of modern business is how to stimulate effective wanting, how to induce people in the average to exert themselves more in order to be able to have and consume more. Installment selling has that motive. Give a man on credit a better house in a better neighborhood, give him on credit a garage and a motor car to put in it, give him on credit all the goods that belong to a higher standard of living than he has hitherto thought himself able to afford, and what will he do? Will he give up these things—the house, the neighborhood, the car and all—because he cannot afford them? Not for that reason. Not for any reason whatever if he can help it. He will think of ways to increase his income. This means only that he will exert himself more to produce other things the equivalent of these, and that will be more than he ever produced before.

II

The Forces of Production Set Free

Once you get the idea that the only use of wealth is to be consumed, either directly in the form of divisible goods or indirectly and more slowly as the

capital means whereby divisible goods are produced, then you understand that people are rich not by any token of what they possess but in the measure of what they consume. We could easily do with 1,000,000 new motor cars a year instead of 4,500,000, but if we did, the immediate consequences would be such a shrinkage in the automobile industry as to throw perhaps 2,000,000 people out of work. They would have no buying power. And the further consequences might well be that you yourself, though wanting a motor car and willing to buy it, would be unable to have one.

How does one get a motor car? Begin there. To get a motor car one must produce other things of equivalent value. Having produced these other things, one must sell them. Who buys them? Everybody buys them, including those who make motor cars. But because people at large, in a spirit of thrift, are denying themselves cars, there are 2,000,000 motor-car makers out of work. They cannot buy your things no matter how badly they may want them. Therefore your own things—which may be goods, ideas, services or labor—are much harder to sell, the demand for them having fallen in proportion as the demand for motor cars has fallen. You may be unable to sell your things at all, or more than enough to meet your bare living necessities, and in that case you cannot have a motor car. The only reason you cannot have it is that other people are doing without cars in a spirit of self-denial. If instead of buying motor cars they put their money in the bank, that will not help. Saving does not

support the motor industry. It does not sustain this rhythm of balanced exchange.

So long as nothing happens to the rhythm, so long as consumption and production are kept in balance, there is no limit to prosperity—to the satisfaction of human wants—this side of satiety. A new principle works. The principle is that consumption finances production. The more wealth is consumed the more it will increase—that is, provided the forces of production have been set free.

Other people had caught glimpses of the truth that prosperity is the total phenomena of consumption. High profits, high wages, even the rapid increase of capital, merely indicate the rate at which people consume wealth. They do not consume it because they are rich; they are rich because they consume it.

More than seventy-five years ago a French economist named Bastiat delivered to his disciples from his deathbed the following dictum: "Political economy should be considered from the consumer's standpoint." Dimly, he had seen a great light. The idea was that the true economic end could be nothing else than consumer benefit. The idea was sound. But for half a century it could not prevail; in Europe it has not yet prevailed against the tyranny of certain false notions about capital, labor, profits, wages, producers as a class and consumers as a class and a natural conflict between them.

In this country the demonstration of that idea has occurred. It is the American contribution to economic experience. It has occurred with no change

whatever in the common principles of what is called a money and profit economy. All exchange takes place in terms of money and the incentive is profit, as in other industrial societies. So it was neither a sinister law of money nor depravity of the profit motive, any more than it was the institution of private property, that ever hindered prosperity here or elsewhere. All differences arise from what people conceive to be the right use of these powers. Yet it had been often proposed to abolish money and profit and destroy private property in order that people might freely produce and freely consume.

Between producer and consumer there is no conflict. As well speak of a conflict between the two poles of electricity. There is the necessity to create by effort that which we wish to enjoy, and from this comes a state of tension, the same in a man who may be living alone on a South Sea island as among 120,000,000 people living together on a continent. There is only this difference—that among 120,000,000 people working together as one economic society there must be a partition of effort and a division of enjoyments. Then exchange, money, capital, method, organization and system, tending to become impersonal, with the danger that much quarreling over division will impede the effort and limit the quantity to be divided. A science of production develops sooner than a science of distribution. Naturally so. Exertion before enjoyment.

III

Mechanical Extensions

Not until about 1900 did the American mind begin to act in a characteristic manner on economic problems. Previously it had been obsessed with production as phenomena. Since then it has more and more emphasized the social meaning of production, and with this change of view came the astonishing revelation that in proportion as you emphasize its social meaning so will it increase as phenomena.*

So great and unexpected has been the extension of the human power of production in American industry since 1900 that it begins to be treated as an event—a second industrial revolution. And the reason why foreign observers find it so difficult to understand is that they regard it as phenomena and not as idea.

In the first twenty-five years of this century—1899 to 1925—the population of the country increased one-half.

In the same period the output of agricultural, mineral and manufactured commodities and railroad transportation increased two and a half times.

* During the earlier history of the country its progress was in considerable part owing to the opening up of new resources. The increase of output during recent decades, however, cannot be attributed to this cause. There have been some new discoveries of minerals, notably of petroleum, but these contributions have been offset by the partial using up of other resources and by the necessity, with the growth of population, of extending cultivation to somewhat inferior lands. The principal factors in the recent increase of productivity therefore are human as distinct from natural factors. *Commerce Year Book of the United States,* (*Department of Commerce*) 1926.

The output of wealth per capita was actually much greater than these figures indicate. The number of people employed in agriculture, mines, industry and railroad transportation increased only about one-third, as against an increase of one-half in the total population. To have produced two and a half times as much wealth in 1925 as in 1899, with no increase of productivity per worker, would have required the labor of 43,000,000 people. We did it with the labor of 23,000,000.

And even yet the increased power of per capita production is not fully indicated. All this time the length of the workday was being shortened. The statistics here are incomplete. We know that since 1910 the hours of labor in all industry have been reduced more than one-tenth. Working fewer and fewer hours, one-third more workers produced two and a half times more wealth in 1925 than in 1899. Thus the increase of the worker's power was greater than the increase in the actual quantity of wealth produced.

To compare 1925 with 1919 will give results even more striking, tending to show not only that the curve of productivity continues to rise; its rise is self-accelerating.

Taking again the four great divisions—agriculture, mining, industry and railroad transportation —the output in 1925 was nearly one-fifth greater than in 1919 from the effort of 1,800,000 fewer workers. Actually, in these four fields, a release of workers, though the output of wealth increased nearly one-fifth. Note that the increase in all cases

is calculated in quantity, not in value. The value, if you took that, would be affected by fluctuations of price.

What became of the 1,800,000 workers released from agriculture, mining, industry and railroad transportation? They were absorbed into other fields.* More than that number were required in the new service of motor-truck transportation alone. The increase in motor trucks in those five years was nearly 2,000,000.

This dispersion of workers is a continuous movement. With no change in productive power per man, such a thing as increasing the product of agriculture, mines, industry and railroads two and a half times in twenty-five years would have been impos-

* If the productivity of industry through mechanization should continue to increase in the same manner and at the same rate for the next twenty-five years, it would at the end of that time require but forty-five men to produce what now requires a force of nearly seventy, and which a little more than twenty-five years ago necessitated the employment of 100 men. Such calculation, however speculative it may seem, does not overdraw the striking advances constantly being made in the way of mechanization and more efficient coördination of effort in manufacturing processes.* * *

This process of mechanization has multiplied the available stock of consumption goods, has made possible the wider use of many commodities formerly in the class of luxuries, and is strikingly reflected in an effective increase of our national income of more than 40 per cent since 1914. The real wage of industrial workers—that is, the purchasing power of the industrial wage earner's average weekly pay—is now more than a third greater than it was in 1914. The increased mechanization also in effect has released many who otherwise would have been claimed for manual tasks for activity in other fields, thus affording opportunity for not only a materially but also culturally richer and broader national life, as is evidenced by the increased proportion of the population attending schools and colleges during the past few years. *National Industrial Conference Board,* 1927.

sible for two reasons. The labor could not have been found, for it would have required one-third of the total population to be engaged in those four divisions of economic activity; secondly, if that amount of labor had been forced into these occupations, there would have been nobody left to man the motor-trucks, mind the filling stations, make concrete roads, build garages, more houses, more factories, more bridges. Which is to say, even if the wealth had been produced, it could not have been consumed.

Why this intensive mechanization of American industry? Machines are not a gift. Like everything else, they have to be produced, and if forces of production new in kind or degree had not been liberated among us, American industry would not be mechanized as it is.

There is no new principle in machines. They are all built upon six simple mechanical powers—the wheel, the pulley, the lever, the inclined plane, the screw and the wedge—and all their actions are compounded of two movements, one rotary and one tangent. Man's first machines were driven by hand and foot power. Then he hitched them to brute power, to water power and to the wind. Only a century and a half ago he learned how to drive them with steam power, and that was the beginning of what we call the industrial era.

We have nothing strange in the line of machines —certainly nothing that other people may not copy, as we to begin with, copied theirs. A machine as such is no more powerful or cunning in this climate than in any other. That we use it more deftly may be

doubted. There is no evidence that we do. But we do use more machines than any other people, and use them harder. Why we do that is the whole matter. We do it because we have a peculiar philosophy of wealth. Pursuing it, we came to see machines from a new point of view.

IV

Dilemma of Quantity

First were certain characteristic ways of thinking and feeling that had to survive the sudden impact of industrialism governed by an alien doctrine of political economy. This has already been represented as a drama of the spirit in which the joint dignity of hand and mind was triumphant, together with the faith that economic and social motives were to be reconciled. Then the approach to economic problems began insensibly to change. You cannot say quite where or how the new ideas emerged. There was an unconscious movement of the mind in the right direction. Now here, now there, someone acted as if upon dual motives. In a given pioneer case the individual would probably be himself unable to say whether it was for profit or for another reason that he embraced the thought of quantity. Enormous additions of power were brought to bear upon the continuous production of goods in quantity in order to reduce their cost and so increase consumption. No matter what the motive was. The idea of quantity was economically sound; it swept American industry and caused a great change of view.

Formerly a manufacturer guessed at his costs, added his profits to arrive at a price, then lifted his prayer for a demand that would bear it. Now it is the other way around. The manufacturer whose object is quantity assumes to begin with, that demand is expansible. It is all a question of price. To reduce his price he must reduce his costs; to reduce his costs he must have quantity upon which to act with more power, higher science of method, keener imagination. Therefore cost is a function of quantity. The more, the cheaper. Instead of adding profit to your costs to make a price, you reduce your costs to make a profit from the price that is necessary to increase the demand. The margin may be small, but when a small unit profit is multiplied by a great quantity the total profit may be much larger than before.

But there is a strange dilemma in this magic of quantity. To keep your costs down you have to go on increasing the quantity. If your output becomes static your costs will begin to rise. Why that is so would require too much explanation. Anyway, it is a fact. For many reasons costs tend always to rise; they run uphill naturally. To reduce them you have to increase the quantity; then to keep them down you have to continue increasing it. Unless you do, someone else will. The competition is keen.

From what now appears in the case it is easily understood why industry is bound to witness the consumer in a new light. Demand is no longer that want which creates itself and comes knocking at the door. Demand equals consumer buying power. Its

potentiality may be calculated scientifically. The United States Treasury's figure of total national income, divided by the population—that is the average consumer buying power per capita. That is the money there is to spend for all goods. The consumer is everybody. Whatever else one may be, one is certainly that—a consumer. The wage earners—they are consumers. They represent in the aggregate the largest single body of consuming power. The quantity goes there. Demand—a very great part of it always—is the dollar in the wage earner's pocket. Two dollars will represent twice as much demand as one.

Who puts the dollar in the wage earner's pocket? Industry does that?

How can it put two dollars there instead of one, to increase demand? Simply by doubling the wage earner's power of production.

From this way of conceiving demand comes a new way of regarding the machine in relation to labor.

Always before this the machine had been regarded as a substitute for labor. The capitalist had no other opinion of it. If the cost of a machine and the working of it were less than the cost of the labor dispensed with, then it was said to be profitable. Industry adopted the machine and the labor was dispensed with. That is why labor so bitterly opposed the introduction of labor-saving machines and why industrialism for so many years was a cruel mirage. Power of plenty, power of quantity, yet want and wretchedness at the base of the social pyramid.

Labor was dispensed with. That part of it for

which the machine was substituted had no buying power. True, as the machine process of manufacture cheapened goods, which it was bound to do, and as the cheapening of goods did ultimately increase demand, the labor that had been dispensed with came to be required again as machine workers. But in the meantime, waiting for this of itself to happen, labor suffered terribly; and the competition for jobs was so great that wages were depressed, according to the ancient rule of supply and demand. So it was that for a long time machine industry did tend to reduce the wage earner's buying power, actually and relatively.

Seeing this, and unable to imagine any other result, social-minded economists denounced machines. Where was the good of increasing the production of wealth by use of machinery if poverty increased at the same time, inevitably, as everyone believed?

A Swiss economist named Sismondi invented against machines what became celebrated as the winch argument. Suppose it were possible in England to do all work of every kind by steam power, so that the king, by merely turning a winch once a day, could produce as much wealth as his subjects had formerly produced by their collective exertions. In that case, all labor whatever having been dispensed with, save only that one daily act of the king, it followed that the people high and low became the king's paupers.

This illustrates no principle in economics. It does illustrate, first, an incredibly naïve notion of machine power, simply that it comes to exist, no one to invent

it, mind it, repair it or reproduce it; and, secondly, the fatal opinion that the machine was a substitute for labor. The truth is that the economists who gave laws to the industrial age never understood machine power in either economic or social principle, never glimpsed the possibilities of an industrialized society.

V

Save the Man; Spend the Machine

In what is characteristic of our scheme the machine is not regarded as a substitute for labor. What we perceive is that when you dispense with the worker as a producer you dispense with him also as a consumer. And as a consumer he is indispensable. Unemployment, once the anxiety of the worker alone, now becomes the anxiety of business. How to sustain and improve the wage earner's buying power is its scientific study.

The machine now comes rightly to be regarded as an extension of the wage earner's power of production in order that his power of consumption may rise. Cheap labor is no longer an asset; its wants are necessarily limited. Unskilled labor represents a waste of human effort. With the same expenditure of time and effort, plus skill, much more may be produced, much more for that reason may be consumed. The cost of digging a ditch with hand shovelers at $2.50 a day may be the same as digging it with power machines handled by men working in gloves at ten dollars a day—exactly the same cost per cubic yard of material moved. But in the latter case you

have high productivity per man, and as a consumer that man is worth four hand shovelers.

A few years ago, anytime before the war, you might have seen men carrying pig iron and steel ingots from the stock pile to the charging hoppers on their backs. Their day was twelve hours long and the pay was $2.50—a little more or less. That was what that kind of labor was worth.

Now you will see this drudgery performed by a crane and swinging magnet. This one machine does the work that formerly required sixty or seventy human burden bearers. If the two men now operating the crane magnet were receiving the same wage as when they carried the load on their backs, then you would say the machine was a substitute for labor. But their wage is now seven or eight dollars for an eight-hour day. This is responsible work and much more productive. What has become of the others? They, too, have been graded up into semi-skilled work, touching machines, according to their aptitudes, and their wages have increased as their labor has become more productive.

The mechanization of American industry does not dispense with skill. On the contrary, it requires at the top more and more skill and at the bottom less and less unskilled drudgery. In the automobile industry at Detroit alone you will find more skilled men than in the entire motor industry of Europe. They are designers and builders of machines, makers of tools and patterns and gauges, engravers of dies, workers in the mechanical laboratories. And in the factories, serving the assembly line, you will find

thousands now graded as semi-skilled who formerly were and might have been always unskilled workers.

One will say there was vision in American industry. Another will say it was necessity acting. The supply of cheap labor was failing; wages began to rise; industry was obliged for the sake of its costs to find ways of doing with power a great deal of work that had been performed as manual drudgery. That is to debate whether efficiency was the cause of high wages or high wages the cause of efficiency. It does not matter. Probably it was both. Here is the rule that works:

Save the man and spend the machine.

This rule now colors the whole language of American industry. For a typical expression of it, take these words from a message addressed to industry in general by the makers and designers of handling equipment, who are now an industry of themselves:

"In many a concern and many an industry the loss of a nickel's worth of material is a great offense, while the waste of men is suffered without the batting of an eye. This is neither logical, humane nor profitable. Wasting men by keeping them at unproductive work, when machinery would do it faster, better and cheaper, is indefensible. The better way—the American way—is to concentrate men upon productive work at better pay and let iron and steel in the form of material-handling equipment attend to the moving of materials."

The great example is that the most prosperous industries, or, within an industry, the representatives of it that have the lowest costs, the highest profits,

the headway over competitors, are those that waste human labor least. And that is saving in the highest sense—the kind of saving that takes the place of thrift as self-denial.

VI

Our Fifty Tame Slaves per Capita

Once people begin really to command the power of the machine as a free extension of themselves, it is as if a new force of Nature had been released. The rise of mechanical power in this country during the last twenty-five years resembles a cosmic advent. The industrial age was already a century old, and no one faintly imagined that it contained a further planetary possibility like this. Regard it:

In the year 1899 the capacity of prime movers in American manufacturing was 10,000,000 horse-power. That was just more than two horse power for each worker, and this was considered very high—the highest in the world. By a prime mover one means only the primary power unit, or the power generating plant, not any of the driven machines that consume the power.

In the year 1925 the capacity of prime movers in American manufacturing was 37,735,000 horse power. That is 4.5 horse power for each worker.

Taking one horse power to be ten times one man power, what do you see? In manufacturing alone we have mechanical power equal to 377,350,000 tame slaves exerting their bodies for us—and that is more

than three times the total population. This is in manufacturing only.

The total capacity of prime movers in manufacturing and mining establishments and in electric plants in 1925 was approximately 73,373,000 horse power.

That is the equivalent of 733,730,000 tame slaves exerting their bodies for us.

And this is nowhere near all. In railroad locomotives we have 26,000,000 horse power, equal to 260,000,000 draft slaves.

In agriculture we have 5,000,000 mechanical horse power, equal to 50,000,000 ground slaves.

And lastly, in 23,000,000 automobiles and motor trucks, taken at an average of twenty horse power each, we have 460,000,000 horse power, and that is as if we had 4,600,000,000 Chinese coolies to carry us about.

The figures are difficult to comprehend merely as facts of magnitude. But consider, moreover, that nearly all this has occurred in twenty-five years.

Since 1899 the horse power capacity of prime movers in manufacturing, mining and electric plants has increased five times. The horse power capacity of railroad locomotives has increased four times. The mechanical horse power in agriculture has perhaps doubled. Twenty-five years ago there were no motor cars.

The total amount of primary mechanical power that could be accounted for in 1899 was probably not more than 25,000,000, or the equivalent of 250,000,000 human slaves.

The total in 1925, including automobiles, was 564,000,000 horse power, or the equivalent of 5,640,000,000 human slaves.

Of the whole earth the population is about 1,750,000,000. In terms of mechanical power we have multiplied it more than three times in twenty-five years. The increase is here. We have created it. Mechanical energy equal to nearly fifty docile slaves per capita!

There are effects that are statistically visible and may be expressed in physical terms. There are others to which we are still so strange that we have no short terms by which to suggest them. There is one, profound and startling, which we have hardly begun to realize. It is as if time had changed, with nobody aware of it, as if the world had suddenly begun to make its revolutions at an accelerating speed and we had made our clocks run faster, supposing them to be wrong.

The machine has changed the tempo of life. Everyone knows this, and yet how little we think of what it means. We look at the clocks. They are running as before. Nothing has happened to the astronomical mechanism. Life nevertheless is running very much faster. Take it not by the clock; take it by the time required to do things, to go from place to place, by the rate at which we consume goods that formerly could not be consumed because enough could not be produced in time for everyone to enjoy them—now as compared with twenty-five years ago. By that measure we are living maybe thirty or forty hours between suns.

VII

Effects of This American Tempo

The tempo of life is so much faster here than in Europe that we may be said to exist on another time plane. What now is to be illustrated is how speed, the tempo, the foreshortening of the time required to produce, distribute and consume wealth—how this has altered the economic premises. For one thing—and this is the particular effect—it has greatly modified the capital function of money.

It is well to make sure we know what we mean when we speak of the capital function of money.

There is this story of money: First it had local token value only. It was something of small bulk, like beads or ivory teeth, that people would take in exchange for any kind of goods; and that was the beginning of a money economy in place of the more primitive barter economy, which was the swapping of goods for goods. As money was standardized in the ideal substance of gold, it came to have a universal hoarding and capital value.

Economists now say, and have said for many years, that gold is not wealth, because you cannot eat it or wear it or warm yourself with it. They have never said it was not capital; they have always treated it as capital, which of course leaves them in the position of saying capital is not wealth. The fact is that gold as the universal money was wealth. It was the perfect form of wealth. If you had gold, you had command of wealth in any other form up to the value of the gold measured in goods. You could

not eat or wear the gold—no—and yet no man with gold was ever hungry or without garments in any civilized society. The merchant princes of old had no bank credit to work with. There were no banks, only money lenders, who kept their wealth in gold and loaned it under pledge that two pieces should be returned as three.

Then banking was invented and there was a new form of capital called credit. The banker issued for token purposes pieces of paper that everybody thought were as good as gold, because, whenever they liked, they could go to the banker and cash them for gold. As a matter of fact, the banker issued more paper than he could cash in gold all at once. He worked on the assumption that it would never come back to him all at once, and it never did so long as everybody was content to think the paper was as good as gold and could be cashed for gold. If they began to doubt it and went all at one time with their paper demanding its face value in gold, the banker had to shut up shop. This happened very often; yet banking survived because the convenience of paper over gold was too great to be lost.

Credit is precisely this power of the banker to issue not only paper in place of gold but more paper than gold. It became presently necessary that he should do this. Commerce increased much faster than the gold supply and there was not enough gold to transact the world's business.

But as such power was bound to be abused, and as bankers were always failing, the state was obliged to

interfere, saying: "It is all very well to issue paper money in excess of your gold. Business could not otherwise be transacted. Nevertheless, it must be made safe. You must have on hand never less than a certain proportion of gold—say, one-half or one-third of the amount of your paper money outstanding."

Such was the origin of the gold reserve, on which all banking now is founded. Thereafter banks announced regularly how much paper they had outstanding and how much gold they had in their vaults to protect the paper; and though everybody could see there was two or three times more paper than the banker could cash in gold if it should happen to be presented all at once, still, that made no difference. Everybody knew the practice and how necessary it was, and knew also as a matter of experience that it was safe. The paper never was all presented at one time to be cashed in gold. The gold remained in one place; the paper circulated continually from hand to hand, effecting the endless exchanges of daily life.

Now it appears that gold has a new function. It is the basis of bank credit. As the use of it in that function increased very fast, use of it directly as either token money or capital declined. The merchant princes were overthrown and ruined by the competition of traders working with borrowed credit.

The next thing to happen was that bank credit, based upon gold reserves in the banker's vault, came to have two distinct functions. One was a token

function—pieces of paper to pass from hand to hand in place of gold. The other was a capital function purely. This has to be made clear.

VIII

On the Capital Function of Money

Suppose you are a manufacturer. You will need to borrow at the bank a great deal of money for token purposes, such as to buy raw materials and to pay weekly wages. But this you need only for short periods—a week, a month, three months perhaps. As fast as the materials are worked up you sell them and from the proceeds you pay back what you have borrowed at the bank. But if you want to build a new plant, that is a different matter. Credit borrowed for that purpose you may be unable to pay back in less than ten years. Hence the distinction. Credit borrowed for only a few weeks, as token money, to buy raw materials and pay wages, would be called fluid capital. It is continually circulating; you spend it, the people who receive it spend it. But credit borrowed for the purpose of building a factory would be called fixed capital, because for a number of years it is fixed there in bricks and mortar and cannot be paid back except slowly and a little at a time from the annual revenues of the business.

A banker must be very careful not to lend too much credit as fixed capital, for if he does, there will not be enough fluid credit left to transact business from day to day—that is, for token money purposes, to buy materials, to pay wages, to effect the exchange

of goods among people. If there is not enough fluid credit for these purposes people get very uneasy; there is a rumor that money is bad, and then somebody will come in the old way with a piece of paper demanding that it be cashed in gold. The banker cannot cash it in gold without drawing on his gold reserve, and he cannot touch that because it is the basis of all the credit he has loaned away. So he is insolvent. He cannot pay. When a good many banks are in this position at one time, from having loaned too much of their credit as fixed capital, there is a panic.

Formerly it happened from time to time, toward the end of a great boom, that Wall Street bankers would say publicly:

"We have got to stop. We cannot build any more railroads or factories or power plants; we have used up all the credit that can be loaned for such capital purposes. We cannot perform any new works until we have saved some more capital for that use."

Then everything stopped and there was a time of unemployment, less spending, more saving, until the credit reservoir had been refilled with credit that could be used for so-called permanent investment.

In fact there is no such thing as a permanent investment. No form of created wealth is permanent. Railroads, factories, power plants, machines —they all wear out, and yet they are capital works for which long-time credit is required. They represent fixed capital.

If you analyze it, the only difference between fluid capital and fixed capital is a difference of time. In

one case the borrower is continually returning the credit to the bank; in the course of a year the same credit may be used many times. In the other case, where it is used to build a factory, the return is slow; that credit cannot be used again for maybe ten years. Purely, you see, a matter of time.

Now it must be obvious that if you reduce the time required to perform capital works so that the credit is sooner returned to the bank, so in the same degree you reduce the difference between what are the fluid and what are the fixed uses of credit.

To prove the controlling importance of time, suppose, as a contractor, you were able to build a house, sell it and get paid for it all between sunrise and sunset. In that case you would not require any credit capital at all. This is not a fantastic illustration; it has only that appearance.

Take it now in reality. You are going to found a manufacturing enterprise. What do you need? A site, buildings, machinery, personnel, a perfected product, then a market; and you might well suppose it would be four or five years from the time of beginning your outlay before your capital began to come back as revenue from operation. You might expect to operate for some time at a loss. So, of course, there is need for long-term credit—that is, fixed capital, repayable in—say, to be safe—ten years.

But suppose you could build a factory, equip it, get your personnel, your product and your market all in seven months. Clearly, in that case you need credit for a much shorter time, since in less than a

year you will be paying it back out of revenue.

Well, it does actually occur now at that rate of speed. One of the big new motor plants at Flint, Michigan, is the Oakland-Pontiac. Seven months after the ground was broken for the foundation 2000 finished motor cars a day were rolling down the assembly line. Another motor plant, even larger, went into production within 200 days from the time of breaking ground.

When capital works that formerly were years in making may be created and brought to the point of production in a few months all relations are changed. Credit for capital purposes is needed for much shorter periods; it becomes sooner productive and self-liquidating, is sooner returned, is sooner available again to finance other capital works at the like speed. And it is the same as if credit capital had been multiplied. Or it may be said in another way. Industry at this tempo creates new capital many times faster than it was ever created before.

When one begins to consider the effect of time upon economic results a vast field opens.

Beginning in 1922, the railroads spent during four years $3,000,000,000 to improve transportation service. Their schedules were shortened, freight moved faster and people could count on its prompt arrival. This was nothing less than an investment of $3,000,000,000 in time. It was as if many times the amount had been added suddenly to the working capital of business. Secretary Hoover, after a study of it, said:

"We found that the lumber dealers were able to

carry on their business with approximately 4,000,000,000 less board feet in stock than six years ago, estimated to be a saving of $200,000,000 of capital in that one industry alone."

IX

On the Output of Wealth and Power of Consumption

Such was the experience of all industries, all business, down to the retail trade. Less money tied up in stocks because stock could be replenished quickly without fail. From this came a practice for which no name quite appropriate has yet been found. A business magazine recently set up a competition in naming it. What everybody calls it is hand-to-mouth buying. The retailer buys from the wholesaler only as his immediate need is; the wholesaler buys from the manufacturer accordingly. The manufacturer, a steel man, perhaps, finds on his desk Monday morning only enough orders to run the mill until Tuesday night. A few years ago if that had happened he would have been scared out of his wits, accustomed as he was to have orders ahead for weeks, months—maybe a year. In the afternoon mail some orders come, the next morning a few more, and the mill keeps running steadily.

What all this means is that less capital lies dead on shelves and in warehouses. Therefore much less capital is required in the transaction of business.

No one comments on American prosperity but to say one great cause of it is the abundance of capital.

The foreigner observer generally sets that out as the first cause. We seem to have no end of capital. Using it up faster than people ever consumed capital before, still we have $2,000,000,000 more or less each year to lend away to other countries.

Seldom does anyone try to account for the fact itself. Where does the capital come from? It does not fall out of the sky. It does not gush up from the earth. The explanation stands illustrated. We create capital two or three times faster than any other people. What does that mean—faster? It means that we perform the work in less time.

Imagine that we lived on a timeless plan, that this life were eternal. In that case it would not matter how many automobiles we produced in what now we call a day or a year. We might produce only one a year and you might have to wait a million years for yours; but if life were forever and time non-existent that would be the same as getting it today. Now bring time back and you see that the number of people who may enjoy automobiles in the cycle of one lifetime is in proportion to the speed at which they are produced. The cost of them likewise is in proportion to the time it takes to make them. You will find it very difficult to think of an item of cost that does not analyze out to be a matter of time. Production per man is not the measure. Production per man per hour—that is it. And there is time again.

Quantity production is the method by which raw materials can be transformed in the least possible time. That is why the costs are low. Time is cost.

Continuous movement saves time, therefore it saves cost.

The head of the Buick Motor Company, telling how in fifteen years the output of cars increased 1400 per cent, with an increase of only 10 per cent in the number of men employed and only 25 per cent in floor space, says:

"Nowhere in our plant is there space for a day's supply of any finished part except frames. It would take a new set of buildings if we undertook to keep such a supply. One day's supply comes in some time during the day before it will be used. If incoming materials or parts, for instance, are unloaded from the freight car and handled directly to the point at which they will be used, this saves the customary handling from stock to the machine. If space is not provided for storing goods between machine operations, the rental charge against material and parts is low. It used to take eighteen days from the time a wheel entered the wheel paint shop until it was ready for use. Now within four hours of the time a wheel enters the paint shop it is on the automobile."

Formerly between machines in long lines you would see tote boxes. One operator filled his tote box, then it was moved to the next machine. But the tote box represented material in a static state, not moving in a continuous manner through time and space. Now no more tote boxes. The machines are closer together, and as one operator finishes his job on the material he slides it along to the next one.

The result of this time saving multiplied in thou-

sands of details is that the company turns its working capital over ten times faster than it once did. That is to say, it needs only one-tenth as much working capital—token money—per 1000 cars of output as it required before.

Acting under a new sense of the meaning of time, particularly as it affects costs, American industry more and more creates its own capital as it goes along. Out of its current revenues it builds more plants and more machines, or replaces old with new, with a view to passing more production through a unit of time; and these capital works are so quickly performed, become so soon productive of more revenue, that expansion of capacity tends to become self-financing in a pyramidal manner.

X

On Wall Street Control of Business

To the degree in which industry becomes self-contained in this way, in the same degree it is able to dispense with the benefit of organized Wall Street finance. Now it is that great corporations which were formerly borrowers of credit in Wall Street are lenders there to employ temporarily at interest their surplus means. Actually, of course, the amount of capital employed in production is increasing. In proportion to the number of wage earners, it is increasing. The capital per worker in the mining industry is $10,500; in railroad transportation it is $8000; in manufacturing it is $5250. Yet relatively to the volume of wealth produced we use less

and less capital, meaning only that capital itself is more productive.

Parallel is the effect of hand-to-mouth buying, the quick handling of stock, more rapid turnover of working capital in business generally—actually the sale of merchandise to the consumer while it is in process of manufacture—all of which is greatly to reduce the amount of credit necessary to conduct trade.

There is no mystery about the abundance of American capital. Time saving enables us to create it faster than any other people; time saving enables us to conduct business with a minimum amount of it. We do not regard machines as labor-saving devices; they are time savers. We gear them to a sense of time.

All this, as you would think, is reflected in the capital market. Formerly the problem of Wall Street was how to find capital for business. Latterly its problem has been how to find business for capital. It has had more credit to sell than American business and industry could use, for all the enormous expansion that has taken place. That is why Wall Street has been going so heavily into foreign loans. And as the necessity of business to seek credit in Wall Street is less, so is Wall Street's authority over business diminished. Once Wall Street, as banker and creditor, controlled big business. That tyranny is broken.

These are new facts of a new time. Whither do they tend? What is this time for that we save?

There is no facile answer. But you may see

already that a great deal of the time we save is for leisure. The hours of labor are fewer. A return to the ten-hour day or the full six-day week would be economically disastrous. Why? Because people would not have sufficient time or leisure to consume that enormous quantity of divisible goods which has come from liberating the forces of production.

DIVISION

I

Yours and Mine and Ours

YOUR share and mine. How is this to be determined? Division is the great end and there is no science of it. The divisions of Nature, so far as we know, are unscientific. The divisions of Reuben, touching land and water rights, caused great searchings of heart because they were despotic. They were bound to be. Profits and wages, as measures of value, are arbitrary; this you immediately discover when you try to prove what share belongs to capital and what labor is worth.

It is perhaps the deepest error of economic thinking to imagine there could be a science of division. There may be a philosophy of it that will comprehend the facts not as truth but as points in fluid circumstance, with always a view beyond them. We are evolving in this country a philosophy of that character. It is another phase of the American contribution to economic reality.

With the first rude act of human coöperation, the problem of division begins. Two men mingle their strength to achieve a result neither one could have achieved alone. There is then something to divide.

If it is a simple difficulty, like moving a stone to discover the treasure, equal sharing is the law of amity. Note, however, that even in this case there is a compound principle. What two men have done is not simply twice as much as one might have done.

Working separately, alternately, independently, they could have achieved nothing. Together they did it. If they separate, that mysterious power of combination is lost. If they do not separate, there is the beginning of organization. Clearly, therefore, a part of the treasure belongs to neither of them as individuals, but to an invisible new entity, which is both of them inseparably—that is to say, society.

Now imagine it to be a stone that two men cannot move—one that ten could not move by exerting their bodies against it. But a third man comes with an idea to exert mechanical power against it. He invents a lever device by means of which, acting under his direction, the two men easily move the stone. How now shall the treasure be divided? You have introduced ideas and capital. How shall these be rewarded? What is their rightful share against that of the two who contributed only the labor? What of the tool? Shall something on account of the tool be charged against the treasure as rent? Moreover, whose tool is it, since all three of them worked to make it?

The third man says: "It is my tool and I am entitled to be paid for the use of it. It is mine for two reasons. First, I invented it. Secondly, while we were making it, which was a labor of three months, I fed and clothed and housed you. Therefore, for all you contributed to the making of the tool—namely, your labor—you have received wages; and what is more, wages is all you are entitled to receive as your share of the treasure; and even so you are better off, for without my idea and my device you

would not have got anything. I made your labor productive."

The two retort: "Without our labor you would not have been able to create the tool or to use it afterward for the purpose intended. No wealth can be created but by labor. Therefore, if you become dogmatic, labor is entitled to the whole result."

Arguing in this manner, they will never agree. In the effort they were united. Having by coöperation multiplied their power to obtain a divisible result, they immediately separate again and begin to quarrel as individuals. If the two will kill the capitalist and seize the treasure, they may; only then they destroy what is more valuable than the treasure—namely, a source of ideas. If, on the other hand, the capitalist leaves the two with wages only and takes all the rest for himself, he has destroyed the willingness of labor to coöperate, and that also is more valuable than the treasure.

II

The Irrational Dispute

This dispute, always in the same fundamental shape, is the demon that has threatened economic society from the beginning of modern industry, founded as it is on the principle of multiple effort. Like every other kind of demon, it has no reality but as a symbol of bad passions and unintelligence.

If it were that everyone separately possessed the means of production—the farmer his land and the artisan his tools—there would be no such quarrel

over the worth of one kind of effort as against another, no wage system, no problem of division. There would be only problems of exchange. But that would be another state of economic life, more or less idyllic, desirable perhaps, but not any longer possible outside of fantasy. Under that system not more than a quarter of the population now existing could be sustained.

In this country, where it has been always easy for anyone who wanted it to acquire land, there is no such problem of division in agriculture as in industry. The agricultural problems are primarily problems of exchange. But as to the industrial means of production, especially in this country, they are so costly and so ramified in method and organization that individual ownership as a rule is impossible. Multiple ownership, like multiple effort, is a necessity of the scheme.

Contrast the village smith and the man in a modern automobile plant forging a crank shaft. The smith does it by hand. His capital, besides his skill, will be a forge that he built himself, an anvil, a hammer, tongs, a few coals, the raw material, a shed over his head. It takes him a day at least, and when he has finished it he charges what he thinks his skill, his time and the material to be worth.

The other, standing in front of a drop-forging machine, a two-ton hammer rising and falling at the touch of a lever, forges crank shafts at the rate of one a minute. The material is brought to him white hot. All he has to do is to place it squarely on the dies and trip the hammer. The power that drives

the machine is delivered to him. He did not invent the machine. In a life-time he could not build one. Yet if it breaks or wears out, another will immediately appear in its place. If he owned it and had it in a shed of his own, he could not use it. He probably could not sell it for more than its junk value, because it fits only there in that one spot as a unit in a series of mechanical powers.

The amount of capital supporting this crank-shaft forger is by no means limited to the cost of the mighty machine before him. Behind him is an originating chain of means and coördination up to the point at which a crank shaft shall appear; beyond him the chain of means and coördination continues to the point at which a complete motor car appears, containing the crank shaft. The motor car has then to be sold, and there is another great organization expressly to do that. If it fails, there will be nothing to divide. Over all this lies a science of management of which he knows little or nothing.

Consider that some definite share of the total automobile product must go to the man who forged the crank shaft, on a machine he did not invent, could not build or use as a smith in any enterprise of his own, moved by power he did not originate, acting on material delivered to his hand white hot, one act among thousands contributing to the creation of motor cars in quantity under a science of method he probably takes very little trouble to understand. What shall his share be? There is the problem of division in only one aspect, as it concerns labor.

Even if all the factors were constant, still it would

be impossible to determine the exact value of this one man's labor. To attempt it would require the work of analytical accountants to many times any imaginable cost of forging a crank shaft, and when they were through they would not agree. Fancy doing this for thousands of different operations in one plant. Besides, none of the factors is constant. Suppose you had a figure to express with tolerable accuracy the value of the labor required to forge a crank shaft. That will be its value in terms of what? Money, perhaps. But the buying power of money is variable. Then will it be the value in terms of the product—that is to say, a definite part of the total value of a motor car? Who knows what the value of a motor car is today or will be tomorrow?

Value is one instant of equilibrium in a flux of innumerable forces; it is either that or an abstraction. No other word has so bedeviled the minds of economists. Having imprisoned it many times in a formula only to see it escape again, it once occurred to them as a solution to abolish the word. Jevons, the English economist, seriously proposed it.

Since you cannot determine the specific value of labor's contribution in a given case, there is no coming that way to a science of division. You might think to come at it by another way. Suppose you take the total product of wealth and slice it by segments, so much for capital as interest and profit, so much for labor, so much for reserve or to increase capital, and so on, by some rational principle, leaving each segment to be divided by any rule that works. But what is that rational principle?

To find it has been the great task of economists. They began by trying to say what were the sources of wealth. These, they have generally said, were three—land, capital, labor. They still say land by habit, meaning Nature in general; they said land at first because economic thinking began when agriculture was the chief occupation and the artisan was not regarded as a producer at all. By capital they meant what was on the land to work it with. By labor they meant at first peasant labor only. As industry rose, these terms were extended in meaning. Land meant natural resources of any kind; capital meant all means of production whatever, including plant, equipment, raw materials, credit and money; and labor meant wage earners either on the land or in factories.

No one will deny that land, capital and labor, in all such senses, are sources of wealth. They are not the only sources. It is strange that economists have so seldom regarded ideas as a source of wealth. Yet it is possible to argue that ideas have created all modern wealth. True, labor was required to externalize the ideas, but without the ideas that half of the population which is now industrial would not exist. It could not exist. Not only would it not exist as industrial population; it would not exist at all. It could never have lived. One must remember always that the most impressive single human fact of the last century and a quarter has been the increase of population that was made possible only by industry.

Having agreed that land, capital and labor were

the sources of all wealth—ideas vaguely included in the term "capital," if at all—the economists proceeded to imagine a law of rent, a law of profit, a law of wages; and it was all arbitrary, since there was no way to prove relative values. Some said capital was of first importance and should be first rewarded, because without capital, labor would return to a life primeval. Even these could not say what the reward of capital rightfully should be. How could they? Others said labor was of first importance because without labor the land would be barren; capital alone could not make it productive. Adam Smith, founder of conservative economic doctrine in Europe, said labor was the true source of all wealth; then he propounded not a ratio of division but a natural law of wages, which was the market price, for labor as for any other commodity, determined by conditions of supply and demand. Karl Marx, founder of extreme radical economic doctrine in the Old World, said labor was the only source of wealth and proposed to abolish capitalists, intellectuals, all people whatever who did not perform manual labor; others were parasites, living on the workers, exploiting them.

Again the dispute stands precisely where it did in the imaginary case of three men who had moved a stone to discover the treasure, one contributing ideas and capital, two contributing labor. So there is no coming by that way, either, to a science of division. Nor is there any way of coming to it.

Science is of method and means. Division is a transaction with life, concerning its ends. What

are the ends? The ultimate end we do not know. We know what it is not. Certainly we do not live in order to produce. The object of increasing production is to make life richer, to free it of fear and want, to multiply its extensions. Idealism is not a science. Faith in the perfectibility of human relationship is not a science. Forethought for the common welfare is an emotion to begin with. There may be a science of profit, if you mean the arithmetic of private gain; but for a sense of profit in works without gain, for the sense of it in deserving the good opinion of your fellow man, there is no science whatever. Division is toward or from a people's day dream. It may be governed by a conviction of things no one has yet seen. That is why there can be no science of it. There may be both an art and a philosophy of it. This is to be approached.

III

Creative Parts

In the work of creating wealth there are several parts. First, there is Nature's part, which is miraculous—the soil, the minerals and gases below the soil, moisture, sunshine, seasons and periodicities, energy, the mysterious principles of life, reproduction and subdivision. Fortunately the earth has never to be paid. She loves to be exploited.

There is labor's part. This is to speak of manual labor. It is a definite part; yet in our arrangement no one is fixed in that part. One may stop in

it or pass through it. Largely that is a matter of temperament or capacity. There is no caste of job. A job of some kind is every normal man's objective. Recently an English visitor, having addressed the students of a well-known American school, was asked by them to say what the difference was, as he could see it, between their school and Eton or Harrow. His response was to ask how many of them were going into business. They were all going to do that. Every one of them had a job in view.

"There," said the visitor, "is the difference. If I had asked such a question at Eton or Harrow, no doubt some of the boys would be going into business. But others would be going into politics or diplomacy or the army or scholarship or administrative work or the management of a landed estate or the government of some dependency."

There is capital's part. Let it be supposed in the simplest way that capital represents all means of production, such as land, mines, power, machines, organization, and so on—together with the credit and money that command them. It is to be noted that in this country, capital in any sense tends less and less to represent individual proprietorship. In place of that is multiple proprietorship, increasingly diffused. The corporation, once the refuge of big business, is become the symbol of association, many little streams of capital running together to make a lake.

Consumer stock ownership is a wide fact, notably in the case of public-utility corporations producing

light, heat and power; their customers become stockholders. So is employe stock ownership a wide fact, of increasing significance. It is to be noted also that as ownership becomes more widely distributed, ownership and management tend to become separate.

Management now appears as an institution in itself, and it is a new principle. Its point of view is not that of either labor or capital. What it does is to combine these and add a third, which is the point of view of the consumer, who is everybody—that is to say, society; and society is conceded to have rights of participation in the division of surplus wealth. This is on the ground as it was in the imaginary case of the two who combined to move a stone. Neither could have moved it alone to discover the treasure. A part of the treasure, therefore, belonged to neither one of them individually, because neither one could have possessed it alone, but to both of them inseparably as a society of consumers.

There is the imagination's part—ideas, that is to say. Ideas are not separately rewarded, save in the case of one who gets a patent and sells his idea on a royalty basis. What happens otherwise, in cases that are as a million to one, is that ideas are freely contributed in the way of one's job; and one who has many ideas will rise through the job, whatever it is, to superintendence, management, ownership. The reward is not for ideas particularly; it is for power of contribution to the science and understanding of production.

Then there is society's part. How society, regarded as an entity above the individuals who compose it contributes to the production of wealth might become the subject of one dissertation. That it does we know. Not only do we know it. We recognize its right to participate in division as society, beyond what its members receive in such forms as interest, profit and wages. Society is the whole organism.

No one of us is society, but society is all of us. Its title to share in the total product of wealth is valid, because it contributes the principle of power that exists in combination. Moreover, it has needs and wants of its own. The members of society are separately discontinuous; society is continuous. Its life runs in time far beyond the cycle of any individual. Therefore it must govern both present and future. Its future objects and interests may often conflict with the present objects and interests of the individual. It has two forms of investment to be always making. One for this time and one for the future. And it must have the means. Where will it get the means if not from the total product of wealth? Education is one of society's investments in its own future. The cost of education alone represents a considerable participation in the division of wealth currently produced.

Merely to distinguish these parts is to see that they are reciprocal. How absurd to debate their relative importance! As functions they are different; as parts they are inseparable. They serve each other, and this, as in any mechanism or organ-

ism, is according to laws of rhythm, harmony and tension. What is jointly intended is a divisible result.

Ideas of economic society in this symphonic character are not original. You will find them scattered all through the literature of conservative, radical and Utopian economics. Always they broke down at the point of division.

What is new in the American way with the divisible result is the will to make the social impulse victorious on a plane of sound business. To see it acting you have only to regard characteristic American division under its three principal heads—namely, wages, profits, consumer benefit. In each case there will appear to have taken place a definite change of view; it will turn out to be all one movement of thought.

IV

The Exploiting Lord's Solution

The American way with wages is what European people are trying most earnestly to understand. The cause of their difficulty with it is historical. Ours is a new time and they do not know it. Ours is new modern; theirs is old modern. And they have not yet broken with feudal time. The hereditary capitalist is still the lord, representing supreme ownership, which anciently was monopoly of the land; and the wage earners are still his dependent people, with a continuous memory of having been exploited for profit.

Here is curious history. When it was as it was between the lord and the people, the lord possessing the land and the people belonging to the land instead of the land belonging to them, then to exploit labor was very simple. It occurred naturally. What the people produced above their own sustenance—the surplus of their labor, that is to say—belonged to the lord and was such as the lord and his retinue could directly consume: food, drink, clothing, armor, trappings and castles. All that was the lord's profit. Everything he consumed was profit.

Now industry appears. The lord becomes capitalist. Not the same lord, to be sure, but the lord in principle, symbol and fact of hereditary power of possession, with the same way of feeling about people and the same notion of his right to take the whole surplus of labor because he owns or provides the means of production.

But a new dilemma presents itself. Hitherto the surplus was such as he or his household could directly consume. That is no longer the case. What shall he do with ten thousand pairs of shoes or half a million yards of cloth? This is machine industry, producing goods in great quantity. Now to get his profit he must sell these gods. To whom? To his own people? They cannot buy them. How, he may ask, can people buy their own surplus? Where will they get the money to buy it with? They have only their wage, and that is just enough to sustain them. If he has to increase their wages in order that they may be able to buy the surplus,

that is the same as to give the goods back to them. In that case, where is the profit? He will have only what he himself can consume and they will have all the rest. He can see no profit in that, no sense whatever. He is sure that if people had so much they would not work; plenty would debauch them or cause them to multiply excessively. Anyway, here is a surplus he can neither consume or sell to his own people, unless, in effect, he gives it to them.

The solution of this riddle, when he thought of it, was quite simple, though perhaps not permanent. It was to sell the surplus in foreign markets, away from his own people, thereby converting it into gold profit. That was it—exchange the goods for gold. Hence foreign trade as it developed under the European system of industrialism; and this trade, unlike any that was in the world before, consisted not in silks, incense and jade; it was in staple goods of common use such as the people who produced them had never enough of for themselves.

There were two fallacies in the lord's point of view. The first was the assumption that if people were prosperous they would cease to work. That false notion, from regarding work as a curse, is implanted in all the economic doctrines of the Old World. List, proposing a protective tariff system to make Germany a powerful industrial nation, said of course in the end, everybody having become prosperous, the competition of free imports would be necessary to save workmen from indolence. American labor is the most prosperous in the world. Is it the most or the least indolent in the world?

The other fallacy was to assume that if labor's share in the surplus be increased by higher wages, profits in the same ratio would fall, tending to disappear. What happens is that the standard of living rises, effective wanting increases, new forces are released and the nature of profit changes. It ceases to be a toll and rises anew from a productive principle.

One is continually hearing that a cause of American prosperity is the existence of an insatiable domestic market for goods, protected by tariffs. American industry therefore does not have to peddle its wares in foreign markets. But that is merely to comment on the fact that the American people do, to a degree elsewhere unknown, consume their own surplus, meaning by surplus all that product of wealth which is more than enough to sustain life in the barest manner. Any other people might do the same thing. Number has nothing in principle to do with it. And as for the tariff, that is a common instrument of economic policy. Although we have used it in a way to oblige high wages, still we must have had a feeling for high wages to begin with, for we might have used the tariff instrument in many other ways.

V

Uprooting the Low Wage Fallacy

In European industry labor is a commodity, governed by a law of supply and demand. The industrialist prefers an overstocked labor market and

speaks complacently of a labor reserve, meaning by that a supply in excess of the demand, so that labor will be docile and wages will stay down. Simply, he is a buyer of labor and his first rule of profit is to cheapen what he buys.

That language was once current in this country. The low-wage fallacy went with the pattern of industrialism as we received it from the Old World. It was not so long ago that American industry solidly opposed any law to restrict immigration, saying it could not do without cheap European labor to perform the manual task. It was so cheap that industry could afford to waste it, and did waste it in a callous manner. But the view has profoundly changed.

Those in the Department of Labor who have worked for many years in the field of immigration speak knowingly of the change. They have seen it take place. Formerly their difficulty was with the leaders of industry, who obstinately said that if they were cut off from the European labor supply they would be ruined. The country, moreover, would be delivered bound and gagged to an organized labor monopoly. Now in all senses the Department of Labor finds industry sympathetic. If it is a question of further restriction, some of the elders may be still a little dubious, wondering how far it is safe to go headlong in one direction, but the young men representing the science of management are spontaneous.

They say, "No, we don't want that cheap labor. It is not good for the country."

There it is. First, is it good for the country? Yes or no. On that ground it shall be decided. And it turns out that what is good for the country also is best for business. This is the invariable fact and has a kind of dramatic quality. It is the rule of experience, possessing apparently the validity of a natural law, that business has only to consider which of several ways has the highest social meaning, and that way, if it is pursued, will prove to be the one that pays best.

The effect of a few great examples upon current thought was transforming and sudden. The records and recollections of the Department of Labor contain prophecies of disaster from closing our gates to the cheap labor of the world by the same elder statesmen of industry who now, as converts, talk the new language as if they had always known it. High wages and low costs; greater productivity per man in order to increase the wage earner's buying power; progressive division of the total product of wealth—and at the same time greater profits than before. They have perhaps forgotten what they formerly believed; at least, they seldom mention the fact of their own conversion.

What has happened in their lifetime to work this change of view? Many will say, and do, that it was the war. Industry was suddenly cut off from its supply of cheap unskilled labor; at the same time it was obliged by the war enormously to increase its output, with wages rising uncontrollably. Therefore necessity obliged it to find ways of doing with automatic equipment a great deal of work that had

before this wasted men in drudgery. That is to say, industry had to exploit machines in place of men. In doing this it discovered new sources of profit. Spending machines and saving men turned out to pay.

This is somewhat true—just enough to be misleading. The way had already been discovered. There was a working science of it, notably in the automobile industry, where it had been demonstrated that by method, power and automatons the productive power of a man could be increased in a prodigious manner, with a result divisible in three directions. The wage earner got more wages, the public got cheaper motor cars and the profits were fabulous. The automobile industry offered only the most striking example. The same principle was working in many other places. Wages rising, costs falling, profits increasing. What the war did was to cause a wholesale reformation of industrial practice, under a new type of mentality, thus bringing to pass all at once a change that had been bound in any case to take place in a few years under stress of competition.

Moreover, the opinion that necessity alone was acting is blind to what it is that has changed. Not any view as to the rate of wage you can afford to pay as you increase the output of labor, not any view as to the effect of high wages on production. It is the meaning of wages that has changed.

There was for a long time no way of regarding wages but as the price of labor. To think of wages

as payment for work performed, roughly measured by the quantity of output—even that was a big step. There was one more to take.

Now more and more wages are regarded as labor's proportional share in the total product of wealth.

It is not enough that wages shall be high. It is necessary that they shall be proportional, for if they are not, if the output of wealth increases faster than wages, then no matter how high wages may be, the relative buying power of labor will fall. This is the view which comprehends the wage earner primarily as a consumer, in which capacity he is indispensable to prosperity.

VI

Finding the True Law of Wages—A Law of Proportion

The great error of industry had been to see the wage earner only as a producer. Not until it began to see him also as a consumer was it possible for a new philosophy of division to be imagined.

The equally great error of the wage earner had been to see himself only as a consumer, and it was not until he began to see himself also as a producer that it was possible for any philosophy of progressive division to act. There was nothing for it to act upon.

These two revolutions of thought have definitely occurred, and there is, for that reason, now the basis of a common language between capital and labor.

The American Federation of Labor, holding its

forty-fifth annual convention at Atlantic City in 1925, declared:

"We hold that the best interests of wage earners, as well as the whole social group, are served by increasing production in quantity as well as quality, and by high-wage standards which assure sustained purchasing power to the workers, and therefore higher national standards for the environment in which they live and the means to enjoy cultured opportunities. We declare that wage reductions produce social and industrial unrest and that low wages are not conducive to low-production costs."

Production first.

Here was a clean break with a doctrine that had obsessed the thought of organized labor from the beginning of its history—the doctrine that wages are paid out of capital's profit. If that were true, then, as a wage earner, the less you gave to the job the more jobs there were and the more of its profit would capital be obliged to divide with labor. It is not true. Wages are paid out of production. Labor at last accepts the fact. In resisting the efforts of capital to increase the productivity of labor it has been all the time limiting the fund of divisible wealth out of which wages are paid. The wage earner now sees himself as producer. He embraces the principle of high productivity. Then he sees himself again as a consumer and stipulates that he must share increasingly in what is produced.

Business has already perceived him in the light of consumer, and how to sustain his buying power is

its own anxiety. It is ready therefore to indorse both sides of the Atlantic City declaration.

Four years before this, in 1921, business had been divided. The evil of postwar deflation was upon it. Profits had collapsed. There were many who said, "Now is the time once for all to liquidate wages." There was a movement to do so. Labor naturally prepared to resist, but that was not what stopped it.

There was a new faith to be tried. It said: "The trouble is not high wages. It is high costs. The trouble is not overproduction from too much capacity. It is that we employ our capacity wastefully. Let us reduce our costs by better method and more power and let wages stand. The result will be a greater consuming power than we ever had before."

And so it was; and so much more it was than anyone could have imagined that capacity had to be tremendously expanded to satisfy the demand for goods.

Recently the American Federation of Labor has formulated what it calls a modern wage policy. In its first period organized labor struggled for higher money wages. But as prices sometimes rose faster than wages, so that the higher money wage bought even less than before, the demand was changed; it became a demand for higher real wages—that is to say, wages calculated on the buying power of money. Now says the American Federation of Labor:

"Very obvious changes in the productivity of labor today induce organized labor again to widen

its wage policy. Higher real wages from a social point of view do not improve the situation of the worker if productivity increases more than real wages. For higher productivity without corresponding increase of real wages means that the additional product has to be bought by others than the wage earners. This means that the social position of the wage earner in relation to other consumers becomes worse, because his standard of living will not advance proportionately with those of other groups. Deteriorating social position—that is, declining purchasing power of the mass of the wage earners in relation to the national product—brings about industrial instability, which will develop into industrial crisis.

"The American Federation of Labor is the first organization of labor in the world to realize the importance of the factor of production in economic society. It no longer strives merely for higher money wages; it no longer strives merely for higher real wages; it strives for higher social wages, for wages which increase as measured by prices and productivity. This modern wage policy lifts the movement to an absolutely new level."

There is the proportional idea of division clearly set forth. Business accepts it. It was business that came to it first from that point of view which regards the wage earner as a consumer. But there is this difference—that what business perceives to be both a necessity and a social ideal, labor claims as a moral right. In the American Federation's formula the sentence, "very obvious changes in the productivity

of labor . . . induces organized labor again to widen its wage policy," is extremely naïve. Those very obvious changes—what are they? Who is responsible for them? Labor has not increased its own productivity. The means, the science and the method have all been provided. There you have introduced capital and ideas again and begin at once to touch the historic dispute. Who moved the stone?

In a study entitled Wages in the United States, published in 1927, showing among other facts that while prices declined 17.5 per cent during 1924 and 1926 wages actually advanced, the National Industrial Conference Board glances at this question of moral right, saying:

"It is clear that the increase in output per worker in recent years is due altogether to the greater use of machinery and power and to better management —that is, to the use of more capital and managerial intelligence, and not to any greater effort or more efficient application on the part of labor itself. Production efficiencies have for the most part been evolved through careful research and experimentation on the part of highly skilled engineering staffs, and this work has been financed by the employer without any assurance that it would bring him a return.

"It seems reasonable therefore that when this investment has turned out profitably, the credit and the profits which result should accrue to the employer and to the investors who supplied the capital for the experiment, and who would not have been

likely to undertake it except for the prospect of profit. If, however, the employer belongs to the school of economic thought which holds that mounting wages, by enlarging domestic markets, are the surest insurance against business depression, he may distribute any portion of the increased profit in the form of higher wages, but it is difficult to establish any moral obligation to do so."

As to labor's attitude it says:

"Labor's argument, briefly stated in general terms, holds that since in the final analysis it is labor which applies and makes effective the improved agencies of production, it is rightly entitled to share in the increased wealth created. While it is undoubtedly true that the most brilliantly conceived mechanical aid to production is worthless without human direction, it is still open to question whether this makes a case for labor's demand."

It is no issue worth raising. What organized labor now demands in the name of a modern wage policy, union and nonunion labor was already receiving. Labor unionism contributed nothing to the American philosophy of division and was slow either to believe in it or try it. Indeed, as that philosophy has clarified and spread, the strength of labor unionism has declined. What was required by scientific management was labor's collaboration to increase production. This organized labor was reluctant to give. All the possibilities, together with the spirit of faith keeping, had first to be demonstrated in open-shop practice. It had to be demonstrated, and was demonstrated, notably in the motor

industry, that with labor letting itself go and with capital keeping faith, division according to scientific management's idea of it was a higher wage than organized labor could extort from capital by threat and conflict. It was higher because the energy otherwise wasted in the struggle to limit output was devoted to production.

Labor is following where it could not have led. To distribute the blame would be gratuitous. For generations the wage earner had been exploited as a commodity and his suspicions were very deep. He had been exploited also by his leaders, most of them honest, who kept telling him that since labor was the true source of wealth, even as Adam Smith admitted, it followed that labor was entitled to the whole product. They exhorted him therefore to rise and take possession of the means of production. Why labor never in fact did this, or ever seldom tried, was a question its intellectually radical leaders were obliged at last to examine. It seemed to them so easy. The owners were few, the workers were many. The explanation was that labor instinctively knew better. It might seize the means of production. That was simple enough to do. How could it seize the source of ideas?

VII

Application of That Law Also to Profits

None of this change of view as to the meaning of wages had ever been possible without also a change of attitude on the part of capital toward profits.

This runs to the same deep level and recreates the ground of economic assumption. One illustration of the change, containing the emotional measure of it, happens to have presented itself in the perfect manner—perfect, because everything about it was unconscious.

Anyone who knew American business twenty-five years ago, particularly anyone who knew it from a Wall Street point of observation, will recall what the state of its feeling was about President Roosevelt. Man on horseback! demagogue! charlatan! radical! As a matter of tact, even as a matter of precaution, one learned never to mention his name carelessly in a Stock Exchange group, for the mere sound of it unexpectedly pronounced had been known to induce pathological consequences. There is a formal record of several Roosevelt panics. Keep all this in mind as the historical fact and look now at a decorative page printed in the August, 1927, number of the Magazine of Business. You see a half-tone reproduction of a painting entitled Modern Industrial St. Louis, a symbolic representation of industry. Beneath the picture is a text on business ethics, *The Acquisition of Wealth*, by Theodore Roosevelt, saying:

"The mere acquisition of wealth, in and by itself, beyond a certain point, speaks very little for the man compared with success in most other lines of endeavor. . . . Furthermore, the wealthy men who make money which does not represent service are public enemies."

In a magazine of business, whose audience is

business! There was no daring or propaganda in it. The editor's thought was ornamental. This is a text to which American business now subscribes. That is the ethic to which it aspires.

What has happened in these twenty-five years?

Clearly, there is a new way of conceiving what profit is. This was bound to occur. A philosophy of division that had changed the meaning of wages could not have failed to bring an original light to play on the question of capital's share.

Profit was another endless, indistinct beast that devoured the reason of economists, besides consuming the prosperity of the wage earner and damning the souls of men. Economic literature is full of his wickedness. For a long time there was no distinction between him and a less Satanic animal called interest. They were hunted together. But after they had been separated by intelligence and profit alone began to be tracked to his source and justification the controversy became even more violent and irrational.

What was the nature of profit? Always it seemed to be the difference between the cost of producing a thing and the price at which it was sold. Why was that difference? Even if you included interest as an item of cost, still there was that difference which somebody charged and everybody paid—and that was profit. Some said under a régime of perfect competition profit would tend to disappear, for everything would have to sell at cost. To this was the objection that if there was no profit, no hope of it, there would be no adventuring of capital. Eco-

nomic society would in that case stagnate and perhaps die. Others, like Robert Owen, said competition was economic warfare and profit was the spoils. Therefore competiton must be abolished together with every trace of the heinous impulse to buy cheap and sell dear. The prôfit motive and money as the instrument of profit must be abolished, else there was no saving of mankind. Profit was the forbidden fruit that had wrecked the Garden of Eden.

That was seventy-five years ago, and the absurdity is still current in the world. It is the dogmatic puerility of communism.

However, there was no way to get rid of the profit motive. All attempts to do so, notably those of Robert Owen, with his labor exchange and labor notes in place of money, went shipwreck on the rocks of human nature. There came to be a fixed cynical notion about profit, that it was a toll upon wealth, charged by those who possessed the means of producing wealth, and charged by no rule of reason. What the traffic would bear—that was the only rule.

Under the old economy, even to this day, that is the nature of one kind of profit and that is the rule by which it is calculated. The robber baron, taking toll of the caravan, learned not to take more than the trader could afford to give, for if he took more, he either ruined the trade or caused the trader to go another way. Generally the industrial capitalist was controlled by that same idea, hence his everlasting dream of monopoly. To possess a monopoly was like holding a caravan pass. It might be in one

case a monopoly of goods that enabled him to sell them dear; it might be also a monopoly of the means of production that enabled him to buy labor cheap. Often it was both. All profit in that character—and there has been an enormous lot of it—is a toll upon wealth. Consumers as such and labor as such are both exploited. Generally it was true that capital's share was determined by occasion, circumstance and privilege. There was no social theory of division, nor had capital any vision of its own dynamic function. What it took for itself was as much as it could, and that was a large proportion of the total product.

Profit taking by that rule limits prosperity, for the obvious reason that it limits the production and exchange of wealth. This is commonly understood. The truth is not so clearly formulated that profit taking by that rule in any modern scheme limits also the power and profits of capital.

Here the proportional idea again, now touching capital's share in the same way as before it touched labor's share. There is no scientific way to determine what the right proportions are. The important thing is to have an idea of proportion. There is no such idea in taking all you can get and calling that your own. That is division by jungle law.

From a true philosophy of division you come naturally to a sense of proportion, and a proportional share defines itself as a quantity that bears a more or less constant relation—ideally a constant relation—to the total product of divisible wealth.

Now a principle begins to act. Probably it is a

law. It is this: If capital's profit in any case is more than a proportional share, it may keep it and consume it; but if it does, the profit ultimately will fail. Why? Because there is no permanent source of profit in itself. It cannot survive but it is rooted in common prosperity, in the well-being of society as a whole; and this is injured by disproportional division.

It is easy to reconstruct a picture of American industry as it was. Many ruins survive. In one of the old textile fields you may still see, in a valley on a water-power site, where the factory was. On a high hill, maybe boarded up, surrounded by a neglected private park, you will see what was the owner's mansion. Obviously, a great deal was taken out of that business as capital's share and consumed. The proportion was steep. The mansion and its setting must have cost more than the factory. With what sequel? The business has vanished. It was ruined by the competition of textile industrialists who, taking only a proportional share for themselves personally, returned their profits to the source, thereby increasing their plant, reducing their costs, improving the status and productivity of their wage earners, until now the volume of wealth produced is so great that no mansion in a private park could bear any important relation to it.

Perhaps the most impressive isolate example is Henry Ford. You may take him to be the richest man in the world. But in what is he rich? Not in money. In twenty years, from nothing, he and his associates have created the largest one unit of indus-

try in the world. It is the most celebrated instance of profit making. Where is the profit? In what form does it exist? A house to live in, what his household has consumed in living, the Wayside Inn, a quantity of antiques and the Dearborn Independent—these are the things Ford has taken for himself personally, and the cost of them in proportion to the wealth he has created is trifling. The rest of the profit has been returned to its source. The more of it that was returned, the more of it there was, until at last it ceases to have the meaning of money, or of anything that can be converted into money. It is power. In one apearance it is personal power; actually it is not, for unless it continues to be employed in ways to increase the wealth of society as a whole it will fail, only to rise again in the hands of another.

He says himself, "All anybody can get out of this is a job."

Although it may be elsewhere less visible or less dramatically emphasized, the same rule has governed the entire American automobile industry. And that is one reason why the motor-car industry of the world is centered here, not in Europe, where they made motor cars first and made them much better to begin with. The motive was profit. That is so. Only, in what character is profit? In the old character profit was an appropriation of wealth, some arbitrary part of the product detained as capital's share, or a toll upon it—in any case, a quantity deducted from the total divisible result of ideas and labor and Nature collaborating.

VIII

Bankrupt Antagonisms

In our scheme it appears that profit, instead of representing anything deducted from the total product, may arise from what is added to that product. Invariably in the great instances it is so. The extraordinary profit runs to those who by ideas and method increase the productivity of capital and labor. That is to say, they reduce the cost. Their profit is not in the price; it is in the cost. With no change in price, they increase the profit by reducing the cost. Thus profit creates itself and is itself divisible. It arises, as was said, from a productive principle and is a new thing.

Profit in that sense is not in what you take. It is from what you give. To make a great profit you have to increase the total product of wealth more efficiently than your competitor. Having made the great profit in that way, it is rightfully your own to consume. You may remove it from the business and do anything you like with it. But unless you return it to its source—the greater part of it—the source will dry up. Why? Because if you do not pursue that line, another will, and he who does will presently have costs lower than yours, and your profit will cease.

Thus it is endlessly that profits are divided with society through a cheapening of goods. This day's consumer of goods is consuming also the profits that capital made yesterday. The man who pays today a thousand dollars for a motor car better than one

that sold for fifteen hundred dollars five years ago is actually consuming that part of the profit from fifteen-hundred-dollar motor cars that was returned to the motor industry in order to reduce the cost of production. The margin of profit in motor cars at one thousand dollars is less than it was in motor cars at fifteen hundred, but the quantity that can be sold at one thousand dollars is greater and the aggregate profit may be even more than before. Wherein you see that the consumer in the act of consuming profits returns them again to whence they came.

The classic economic dogma of antagonism is breaking down. We are privileged to witness that catastrophe, being the authors of it. Wages and profits are not opposed. Both derive from production. There is properly no conflict between producer and consumer. How could there be? Producer and consumer are the same person. Prosperity is from increasing the sum of social wealth for purposes of proportional division, and all its phenomena belong to the wonder of orchestration. Everyone's part is supported by another's part. One pursuing private gain in a ruthless manner as an exclusive end is a wild piper playing his own tune in a symphony band. He is not of our time and way of life.

Such thoughts become suddenly commonplace. They occur now more frequently in what business writes about itself than anywhere else. Take as typical this paragraph from the May, 1927, economic circular of the National City Bank of

Wall Street, on the growth of wealth since 1921:

"Inasmuch as the amount which the individual can spend on necessities such as food and clothing is fairly limited, the excess has flowed out and created the demand for better housing, for automobiles, radios and the like that has gone to sustain the business boom. It has also made possible a larger attendance at schools and colleges. Shortages created by the war may be made up and the stimulation of business derived from them dissipated, but the impetus received from an improving state of general well-being goes on so long as each individual recognizes, and in his dealings with others is guided by, the principle that prosperity is dependent upon an even exchange of goods and services and that it is the wealth which each one produces that enables him to buy the products of others."

An even exchange of goods. How radical that would have seemed only a few years ago!

We are hardly aware of the extent to which the idea of profit as private gain from ownership has been subordinated to the idea of profit as a wage for capital, social benefit regarded as its justification. One takes it for granted, yet it is a significant fact. Great bodies of capital appear that are practically unowned, unless you should say society owned them. The principle of private ownership has not been touched. Yet the meaning of ownership in these cases has fundamentally changed.

As the holder of shares in a large corporation, one is supposed to own some arithmetical part of the assets. That is technical. Does one in fact

own that part? It is nothing one can separate or take away or do with at all as one personally likes. Nor could all the stockholders together act as absolute owners of a property employed in producing wealth essential to the welfare of society. Could they, for example, in a pet with society, shut it up willfully or destroy it? Formerly the owner could have done either—and any thought to the contrary would have outraged his sense of right.

As ownership becomes more widely distributed, capital shares represent ownership in no sense of old, but, instead, a right to participate in the profits. And more and more it is that the owners do not control the policy that governs the profits. The management does that. Management now becomes an institution apart from ownership. If the case to be supposed is that of a public-service corporation, which may be the highest example, the management says to the shareholders, technically the owners:

"We undertake to keep your investment safe and to return you 6 per cent on it. Profits more than that we propose to divide under three heads of benefit—namely, property benefit, to improve the service; employe benefit, to improve relationship and reward loyalty; and, thirdly, consumer benefit, which is the final aim."

What the investor gets beyond his 6 per cent is a sense of security, for he may know that a property so handled will endure.

One is no longer surprised to find in the annual reports of corporations to their shareholders that a

sense of social achievement is stressed above profit. The report of the largest light-and-power company in Virginia begins:

"Your company is a public utility holding company. Its purposes are twofold: First, as to the public served, to improve and develop the service in the territories occupied; and, second, as to the investing public"—to provide a sound investment.

The public first.

The last annual report of the largest public-utility corporation in the world said:

"The ideal and aim today of the American Telephone and Telegraph Company and its associated companies is a telephone service for the nation, free, so far as humanly possible, from imperfections, errors or delays, and enabling at all times anyone, anywhere, to pick up a telephone and talk to anyone else anywhere else, clearly, quickly and at reasonable cost."

Service first. And from that motive more wealth among us in telephones than among all other people in the world together.

A proportional wage for labor, a proportional wage for capital, and from the profits that are over a distribution of benefits to the property, to the workers and to the public—that is management's idea of division.

In this American philosophy you may find economic chivalry by looking for it. If you do, it is implicit there. The conscious view is still pragmatic. Any other is obscured in a curious way.

Long before this a state of society had been imagined in which the desire for private gain as the paramount economic motive should yield to the idea of social function. But nobody had ever imagined it would really pay.

THE NEW MEANING OF BUSINESS

I

Rise of the Moral Structure

THINK how seldom it is nowadays that you hear anybody say, "Business is business." Or think what your mental reaction is when you do happen to hear a man confessing that cynical code. You rank him low in the scale of business. Why? Because business is becoming both a civility and a profession and your expectations of it have changed.

Two powerful forces are there acting and reacting. Business expects you to respond to the view it now wishes to take of itself, and even though you may not be aware of it, you do. Business, in turn, responds to your higher expectations of it.

So all structures of moral progress are laid up, one course at a time, in a tedious manner. The beginnings of the foundation are never witnessed. Words and ceremonies begin with the corner stone, which is a middle symbol, already supported by ideas sunk deep in the ground. Presently there is an elevation. You cannot see it originally because it advanced so little by little and you were looking at it all the time. Almost you forget by the time it is finished what was there in that place before.

Regard now the elevation of the structure that may be called the new meaning of American business. In June, 1927, a group of big business men were gathered together to dedicate a group of build-

ings comprising the George F. Baker Foundation of the Graduate School of Business Administration of Harvard University. George F. Baker is one of the very rich elder bankers of Wall Street. Owen D. Young, who made the dedication address, is chairman of the General Electric Company. He said:

"If I were to speak for men of business, which I am none too well qualified to do, it would be to express gratification that business is recognized at last as a profession, and being so recognized by Harvard, becomes a learned profession. If I were to speak for men of learning, which I am less qualified to do, it would be to express satisfaction that scholars are now to find their way to the market place as they have heretofore to the pulpit, to the law courts, to the hospital and to the forum.

"Looking backward, one wonders why our visit for this purpose had been so long delayed. Why is it that the Harvard Business School was not founded until 1908 and not adequately housed until this hour? The medical school was established in 1782, the law school in 1817 and a divinity school in 1819. The education of the ministry, however, may be said to have been a prime object of the foundation itself, and the chief effort of our earlier years. The founders of Harvard said that they 'dreaded to leave an illiterate ministry to the churches when our present ministers shall lie in the dust.' Is one to conclude that Harvard was fearful of an illiterate ministry of religion in 1636 and was not apprehensive of an illiterate ministry of business until 1908?"

II

What Was There Before

And can you remember what was there before—what American business signified before this new elevation of meaning came into it?

Less than twenty years before this, Mr. Justice Harlan, of the United States Supreme Court, dissenting from an opinion of the majority on the construction of the Sherman Antitrust Act, reviewed the background of that famous piece of legislation in these authentic words:

"All who recall the condition of the country in 1890 will remember that there was everywhere, among the people generally, a deep feeling of unrest. The nation had been rid of human slavery—fortunately, as all now feel—but the conviction was universal that the country was in real danger from another kind of slavery sought to be fastened on the American people—namely, the slavery that would result from aggregations of capital in the hands of a few individuals and corporations controlling, for their own profit and advantage exclusively, the entire business of the country, including the production and sale of the necessaries of life. Such a danger was thought to be then imminent, and all felt that it must be met firmly and by such statutory regulations as would adequately protect the people against oppression and wrong, Congress therefore took the matter up and gave the whole subject the fullest consideration."

His voice even then was of the past. He was in-

sisting that the Supreme Court should interpret the law in 1911 as it had in 1896, literally; but the majority, from wrestling with a sense of new unformulated problems, had groped its way to a different conclusion. Conditions were changing. Change itself had become a condition. The growing magnitude of business had overwhelmed corporations as already partnerships had been overwhelmed. Then had appeared the trust, a group of corporations acting together. Moreover, the relation between business and society was no longer volitional on either side. It was an imperative relation.

Many people believed, and it seemed logically indicated, that what had to be decided was whether business should govern society or society should govern business. But how did society propose to govern business? By device of law, called the Sherman Antitrust Act, intended to impose upon business a rule of competition, thinking thereby to limit the power of business in any one of its body formations. That, of course, was fear. Oppositely, society on its material side was greatly to be served by the very power it wished to limit, since business in big vertical and horizontal formations, theoretically at least, could create wealth in a prodigious manner on a falling curve of cost, thereby not only increasing the quantity of goods that satisfy human wants but at the same time making them cheaper.

Moreover, as to competition—and this was the immediate question—who knew the whole nature of it? Hitherto it had been viewed always in one light, as struggle and survival. What did that mean if

not that the strongest and most ruthless were bound to survive? In that case, the ultimate end of competition was monopoly, and monopoly was the evil to be feared.

Was there no other truth about competition? How came it to be that in nature, although the competition was apparently remorseless, still many soft frail forms were seen to survive and flourish? What was that principle?

At that time a thought that has since become commonplace among us was still strange. That was competition in service. The first notable application of it was in the case of railroads. Competition among them as warfare, touching rates particularly, had produced such intolerable evils that the Government, through the Interstate Commerce Commission, was taking the power of rate making away from them. Thus, on one hand, the Government was making it impossible for the railroads to do what it was, on the other hand, trying to make all other business do.

To this contradiction we had come. On one side was fear of the power of business. On the other was contempt of public opinion and rule of the ruthless ego, resisting every effort on the part of society to impose upon it a sense of social accountability. But when the railroads could no longer compete in rates, was that the end of their competition? On the contrary, it became keener than ever before, only in a new character. It was competition in service, social utility, civility, with rates alike to all. Was that something business as a whole might learn?

Such reflections as these animated the majority mind of the court and moved it to express an opinion on the law that had nothing to do with the case. It said the law could not be understood to prohibit every form of contract in restraint of trade, because almost any contract you could imagine had in it some element of restraint; nevertheless, on specific ground, it dissolved the defendant trust, saying it was bad as a proposition of fact. Mr. Justice Harlan concurred in the verdict and dissented from the exposition. He did not overdraw the picture as it was in 1890. What he did not share was a vision of faith that was in his associates. They had somehow got sense of a new principle transacting in these matters. They had recognized the signs of a movement in business from a law of the ego to one of the herd.

What has happened to the law by interpretation is the obverse of what has happened to the regard in which business holds itself, and this is very striking on both sides. The law has been completely revolved.

The Sherman Antitrust Act says: "Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several states, or with foreign nations, is hereby declared to be illegal."

In 1896, deciding the celebrated Trans-Missouri Freight case, the court definitely refused to construe into the law either word "undue" or "unreasonable," before restraint. Twice it did this and

then declined to hear the matter argued. It had made up its mind and the law was clear.

In 1904, deciding the famous Northern Securities case—the Northern Securities holding company, resulting from the Northern Pacific corner on the New York Stock Exchange, was an idea of locking up control of railroads away from men like E. H. Harriman—the court said: "The mere existence of such a combination and the power acquired by the holding company constitute a menace to and a restraint upon the freedom of commerce which Congress intended to recognize and protect."

The first interpretation now is complete. The words of the law are absolute, permitting of no definitions, and bigness or power in itself is a menace and illegal, regardless of how it is used.

Then came the Standard Oil and American Tobacco cases in 1911 and 1912 respectively. The court dissolved both trusts, not because they were trusts, not because they were big, but because they were proved by the evidence to be bad. Here the court begins to hold with Theodore Roosevelt's distinction between good trusts and bad trusts, and it is in each case a moral question on the merits. In both cases, however, the court paid more attention to the law than to the deserts of the defendants, and declared that the law must be construed by light and rule of reason. In doing this, as Mr. Justice Harlan said, the court reversed itself; moreover, he said, it committed an act of judicial legislation.

Well, but it could not stop there. It had done

what it had said it could not do. It had construed into the law the word "unreasonable," before restraint. It had yet to undo the dictum that bigness or power was in itself illegal. This it did in 1920, deciding for the United States Steel Corporation and against the Government, on the ground that although this trust had been formed in defiance of the law, although it had committed acts in the same spirit, still this had been long before; and meanwhile its behavior, its relationship to the industry as a whole, all economic conditions surrounding it, had changed. The Government contended that power to do wrong was unlawful, no matter how it was used. The Government, said the court, was wrong. The law was directed against monopoly, not against the expectation of it, and the United States Steel Corporation had ceased to behave as a monopoly. Therefore it need not be dissolved.

As writing, the law has not been touched. Its meaning has been revolved.

But this did not happen, could not have happened, until business was ready to see itself by implication of such words as these: "The spirit of the business world was exploitative and speculative. Make use of every resource that comes to hand, buying labor and materials for as little as possible and selling dear that you may profit well. This may seem but a page torn from the business code of today, and so it is, but it is only one page. The others reveal faith in the problem of service as a source of satisfaction both in pecuniary profit and in professional pride.

"This newer note is a product of many forces, not the least of which, perhaps, is the growth of enterprises so extensive that men of large caliber, fully the equals of the merchant princes of an earlier day, but divorced from the direct appeal of profits, have had to be hired to manage them. Administration and management, as distinct functions apart from those of either *entrepreneur* or capitalist, now occupy thousands of men whose work impels them to think of business as something more than purely a profit-producing procedure. The former one-sided philosophy of egoism which so generally characterized the business ethics and morality of the past generation, which declared business was business, is giving way to the new philosophy which sees that business 'is also an altruistic public service and commerce a system of coöperative social conveyance.' "

That is business talking to itself. It is a quotation from a bulletin addressed to the production executives of American industry by the American Management Association, which represents big business.

III

Motives

Business for the first time in its life is articulate about itself. In a few years it has created an enormous library of self-regarding literature, most of it dated since 1900. On the other side, as to the public's view of business, there is a mass of garrulous

writing, much of it wholly unresponsive to the changing state of facts.

Taking it back to the personal reference, suppose we try asking ourselves what our common expectations of business are.

First, perhaps, we think of value, quality, service. These integrities we take for granted in a manner that would have astonished those of the preceding generation. Our wrath when we have been disappointed is evidence that disappointment is not the rule. Formerly the hazard of buying was in both price and quality, and the idea of service was so exceptional that—as, for example, in the matter of replacement parts—the manufacturer's general notion was that once he had sold you the machine you had to have the parts and these he could sell to you at a high profit, exploiting your necessity. Now service—here limited to the sense of continuous customer satisfaction—is a universal and competitive rule of business.

As to price, or value, you may still believe there is some hazard there, and of course there are many instances of apparently unreasonable discrepancy between the cost of producing a thing and the price at which it reaches the consumer. Generalizations are necessary here. First, the price, whatever it is, is one that everybody pays, and is in itself an open challenge to competition. It was not until after the Civil War that retail merchants generally adopted the one-price system of merchandising. Before that every transaction was by higgling over the counter. When, in New York, A. T. Stewart began marking

prices on his goods, permitting no deviation, other merchants could not imagine that he would not be ruined. If he stuck to it and honestly meant it, then it would be simple for his competitors, knowing his prices, to undersell him just enough to get all the trade. It did not work that way. No one could afford to undersell him, because with the fixed prices went also quality, and the profit was reasonable. What happened was that in a few years all the important business of retail merchandising was obliged to adopt the one-price system.

As for prices in general—value, that is to say—one must look not at a specific bargain, at one or two among millions occurring every minute, but to the average economic cost of the total quantity of goods consumed. Is that rising or falling? Everyone knows it is falling. Proof is that we are able steadily to increase the quantity and variety of our satisfactions. This or that may be dearer; other things, by offset, are cheaper. Coal and lumber are dearer, automobiles and electric appliances are cheaper.

The rule is that those things have been cheapened most that represent the highest degree of fabrication; and this, when one thinks of it, seems an incredible fact, with wages steadily rising. It shows what skill, imagination and power can do when intensively employed. Living in general, measured by the average person's command over goods, is cheaper here than ever before, and cheaper than anywhere else in the world. Prices, after all, are relative. What do we have and consume? That is value in

the right sense. Apart from any theory of its social function, merely as sound modern principle, business is obliged to lower the price of goods continuously in order to sustain its volume. Profit in our scheme is from volume. And volume is from pressing goods lower and lower through the social pyramid to the every base.

Value, quality, service—such are commonly our expectations of business. Only, perhaps, we do not realize that thirty years ago one who had taken so much for granted could not have been trusted to spend the budget of an ordinary household. However, as you see, if these three virtues of business are moralities at all, the character is utilitarian. They create customer confidence, build assets of goodwill and name, and turn out to pay very handsomely. Why, therefore, had they been wanting in business?

They had not been always wanting. Here again is curious history concerning the effect of the machine upon business behavior. Old-fashioned business was honest. The importance of goodwill was understood. Service, of course, had not been thought of; there was no need to think of it. Merchandise did not include such things as motor cars, tractors, private light, heat and power plants, automatic electrical appliances, farm implements with moving replaceable parts, all requiring continually more or less service. That was another world. Merchants had relations with one another extending to distant places and foreign countries, and these were governed by a code older than any modern language.

The relations of the merchant to his public, how-

ever, were local, and he himself was subject to community pressure. Unethical practices, quickly found out, not only got him into trouble with his customers; he found himself in disgrace with public opinion as a citizen and might be singled out for words of reproach even as he sat in his church pew. This happened to Robert Keayne, one of the founders of the Boston Town House, who, when complained of before his church for having overcharged his customers, "did with tears acknowledge and bewail his covetous heart, yet making some excuse for many of the particulars which were charged upon him, as partly by pretense of ignorance of the true price of some of the wares and chiefly by being misled by some false principles."

Then suddenly the world is another kind of place. Machine craft displaces handcraft. Industrialism and factories succeed guildism and small workshops. What was trade, concerning itself only with exchange, becomes business, concerned also with production. At the same time new means of transportation are created. The affair between business and the public is no longer local. It tends to become anonymous, and business morality passes under the strain which moralists used to propose as a test of individual behavior, asking, "As against the certainty of large private gain, how would you weigh the life of an unknown man in China?"

In his dedication address at the Harvard School of Business Administration, Owen D. Young explained it in this manner:

"Then the area of business operations widened.

The products dealt in became highly specialized and technical. A man could not sell a spavined horse as sound in his own community without penalty, but he could sell a spavined motor as sound in some other community, perhaps indeed halfway around the world, without being quickly discovered at home. Even if discovered, the penalty was not so great. The sale of a spavined horse to one of his own community may have been a moral delinquency. The sale of a spavined motor to people quite unknown may have been regarded locally as a clever piece of business. The church became increasingly powerless, and local opinion might well be not too critical of a man who brought wealth from other places to his home community, especially if he contributed to the local hospital and was otherwise generous in its distribution. In a word, the widening area of business . . . outstripped all local sanctions and tended to leave the individual free from restraints."

Greed is the most futile kind of ugliness, and has, moreover, no imagination. Business by this rule—let the buyer beware—was not only insecure and in the long run unprofitable; it was bound to fail for precisely the same reasons that caused piracy's downfall. There is much more profit in the continuity of trade than in fraud or pillage. If you cheat people they will stop trading; if you plunder them they will have nothing left to trade with.

What next happened was inevitable. There was no limit to the growth of business but the consuming power of the whole world. The physical limits of the world were fixed, but as business grew, this

world contracted. The post, the telegraph, ocean cables and steam transportation, foreshortened the time dimensions of space. A distant market ceased to be an opportunity you could exploit with impunity. You were too quickly found out and published, and then you lost the trade. Moreover, you gave your community or your country a bad name, hurting all trade, and for this you were not easily forgiven at home. Tears in the local church would not absolve you. In foreign trade, for example, a few shipments of shoddy goods might create against all goods of the same national origin a buyers' prejudice, and that would be the nation's loss.

Out of all this came trade-marks, brands, standards, new codes of business practice, all with a view to creating customer confidence. Now when a Chicago implement maker sends a threshing machine either to Kansas or Australia, or when a Detroit motor-car maker sends forth an automobile to be sold to whom it may concern, he sends his reputation with it and plans beforehand to follow it with service. "Satisfaction guaranteed" ceases to be a hollow selling phrase. It is a principle without which business could not progress. This intelligence now holds throughout. When sugar was sold in barrels —and that was in our own childhood—sand in the sugar was a staple almanac joke. Who put it in no one ever knew. It had to be either the grocer or the refiner, and they accused each other. Now sugar is sold on the refiner's reputation, in sealed packages, and anyone proposing to put sand in it would be examined for lunacy.

It is clear that any of these are utilitarian motives. They pay. They would more easily prove that an ancient pride of trade has been restored to modern business than that any new meaning has appeared. That is all true; it is further true that so far as you can examine the mind of modern business, expressing itself in codes of ethics and ideals of behavior, you will find the practical element to be always chemically present. Well, as to that, there is a school of thought to hold that the basis of any morality is utilitarian; moral is only a mode of conduct that somehow rewards itself. That may or may not be, and it is irrelevant. There is a new meaning in American business. All such motives as are represented by ideas of value, quality and service may together be put aside, and still our expectations of business are not exhausted. What more do we expect of business?

Harvard University now confers degrees in business as she confers degrees in law, and President Lowell speaks of business as the oldest of arts and the newest of professions. A few years ago one who had referred to the profession of business would have had some difficulty to make the meaning clear. Now everyone knows what it means and more or less of what it implies.

The distinction between a profession and a business or between a profession and a trade is not merely that a profession is supposed to call for formal training and a high degree of specialized skill. That would mean only a difference of capacity or education. There is a much deeper difference, and

this is in the way a professional man regards his work. It may be a gainful occupation, but in his exercise of it he will be guided by considerations other than those of private gain. He will feel, in the first place, a sense of obligation to the profession itself, not by any act of his to injure its good name—that is, disappoint the public's expectations of it. He will be jealous of its ideals. And with a view of his own work and the profit thereof, he will combine a view of social ends.

The mechanic is not expected as a mechanic to see his work in the light of its social implications. The engineer is. Therefore engineering is a profession. In this country it is, and it was not until engineering had come to be a profession here that the engineer extended his view to include social facts. Formerly he had been content to keep a technical field. Now nothing that concerns the scientific management of business is beyond his view, so that he includes, along with problems of power and productive method, such other problems as those of distribution, social benefit and human behavior.

IV

The Age of Dread—Socialism, Revolution or Self-Conquest?

It may not have been inevitable that a profession of business should appear. It has appeared nowhere else, though the need of the light it breaks into economic darkness was universal.

Not for this country alone, for all industrial

countries, the last third of the nineteenth century was an age of dread. Pessimism, foreboding, a kind of cruel cynicism, cast ominous shadows on a scene of triumphant material achievement. By use of machines and science, man had integrated a power he apparently could not control. Certainly he did not comprehend its meaning or foresee its consequences. This was not merely a power to externalize things. The increase of things was the obvious result.

What the power did unawares was to alter the status of humankind on earth. Not only did it change the environment; it created a new race—namely, that part of the population which is called industrial because it lives by modern industry and could not live by any other means. In Western civilization this now is more than half the total population.

Rightly to perceive the status of it, you have only to imagine what would happen to it if suddenly the world in all respects were again as it was a century and a half ago. Do you think it would return to the land? It was never on the land. Moreover, the agricultural population now existing is certainly quite all—probably much more—than the land could sustain without the tools, the power, the method and all which have been supplied and continue to be renewed by industry and industrial science; and all this, according to the supposition, would be wiped out as if it had never been. The industrial race would perish. That is what would happen to it, for

it is plus upon the earth and industry is its mother.

Industry, including all the mechanical and scientific knowledge in which it consists, is only a hundred and fifty years old. In that time it has created a new civilization, a new race, and has introduced change as a visible condition of life. The only certitude is change. The only stability is the rate of change. Think what that means.

For thousands of years before, change was so slow that it could not be measured in the contrasts of one lifetime. People died in the same environment in which they were born, unchanged; life as they left it was life as they found it, even to its material forms. One generation could not see both the beginning and the completion of an important building, such as a cathedral. Life was repetition: change was historical.

Then suddenly man discovers the secret of power —Science is the law of it; machine is its being. Knowledge thereafter is pursued with a new intention. The intention is practical. Knowledge must work. Man no longer beholds the sun as a heavenly body and admires its geometries in space. He studies it cunningly as a chemistry, hoping to learn more about the properties of matter. He regards the earth not as a goddess to be wheedled but as a mass of matter in tension, containing hidden sources of energy that perversely evade his control. He does not solicit her secrets. He demands them. Once clumsily he found a thing first, wondered at it, spent a long time thinking what he might do

with it. Now his intentions run beyond his knowledge. First he wants something and then sets out to find it. He knows beforehand what he will do with it. Industry, the new mother, is waiting for it.

V

Sudden Advent of a Power No Law Could Tame

The tempo of existence begins to change. It changes more in a few years than in all past human experience, actually; and the rate of change is self-accelerating. The environment becomes fluid. It alters in one lifetime beyond recognition. Try, for example, to imagine American life without automobiles, radios, movies, electricity. You cannot imagine it. Yet you need not be an old man to remember that there was life without these things. What transforms the environment and produces all change is that power of machine and science rising higher and higher together.

Where wheat was reaped last year does an industrial city stand this year? That is the creative magic of this power.

Where there was a human relationship between master artisan and journeyman, is there now a class conflict between capital and labor? That is the social disaster of this power.

Where formerly there were slow tides in the well-being of people from cycles of fecundity in the earth, now are there sudden alternations of boom and crisis, with mass unemployment as a social scourge, effects

as terrible as famine? That is the economic stupidity of this power.

Where formerly there had been rich and poor, known to each other, are there now industrial slums and incredible riches, both anonymous? That is the indifference of this same power to the spectacle of humanity.

Man's nature had been projected in a grotesque manner, both the goodness and the badness of it, by terrific magnification, and more the badness than any goodness, because in the exercise of this power he conceived himself to be neither moral nor immoral—merely dynamic. Moreover, he had said he did not control this power. He had said the power was controlled by natural laws, wherefore he was not responsible for the results.

The last ten years of the nineteenth century were crucial. Thoughtful men were asking: "What is it worth to go on creating material wealth in this way? Is society as a whole any better off? Are we not beguiled by things to give ourselves into a bondage from which there may be no escape? What is all this running to and fro of people to get themselves better fed and housed and clothed and entertained? They consume a great deal and possess nothing, not even their own lives. Is it not an illusion that we are progressing at all? Are we not selling ourselves out to a power we cannot control, one that may in the end destroy us?"

It is astonishing now to remember who they were that entertained such gloomy reflections. Not demagogues and strife bringers, for these have no re-

flections, but men full grown in wisdom, seers and elders, even to members of the United States Supreme Court who, knowing what the law was, all the more clearly perceived its inadequacy. The American mind at this time was heavy with foreboding. And yet the power threatening to enslave a free people was a creative power. Without it modern society could not exist. Its life was caught on this wheel.

Capitalism, industrialism, monopolism—these were all embraced in the one distinctively American term, big business. It was the power of big business people dreaded. The only rights existing in it were rights of proprietorship; and the proprietors were feudal minded.

There was nothing new in feudal mindedness, nor for that matter in such ungoverned exercise of the human will by the few as to outrage the humanities of the many.

The problem lay in this, that big business was now met with for the first time in human experience. Nobody understood it. Big business did not understand itself; it possessed no history. Laws representing the solutions of a pre-industrial civilization did not comprehend it, and of course were impotent to deal with it.

That is why society's first efforts to reach big business by law produced only worse confusion and increased the fear that it would turn out to be uncontrollable; for as the state undertook to regulate it against its will the struggle was invariably disastrous to the complex rhythm of production and

exchange by which life was sustained. The law was generally stupid for want of economic understanding in the political mind, and ineffective for the reason that while it was writing conditions were changing. How write a law to anticipate change or to comprehend change itself as a condition? If the state should go so far as to take control of business with intent to administer it, instead of laying down the law to govern it, that would be socialism; to seize it would be revolution.

VI

Business Immemorially Stigmatized as a Vulgar Art

There was all the time an obscure complication. Why was there no sense of socialness in business? Why so far as possible was the business mentality excluded from participation in government? Why was it conceived to be a function of government to protect society from the power of business, as if business were minded to devour society? What was the difference between those who represented business and these who were all other people?

None, really; only an outworn tradition of it. As business by succession represented all the despised activities of mankind, so it inherited a very ancient social stigma.

All the early political economists treated traders and artisans as parasites. Exchange and production. How strange, since we live by these activities, that they should be socially disesteemed! But this had been immemorially true, partly no doubt

from a far Oriental taste that causes the æsthete to despise a flower, no matter how beautiful it may be, that has kitchen associations, and partly from a lingering tradition that superiority divinely exists in the warrior or hero caste, whose contempt for traders and producers was sublime.

Sam A. Lewisohn, president of the Miami Copper Company and an active member of the American Management Association, has an interesting essay on this subject in the August, 1927, number of the Management Review. Business, he says, is only now setting itself free from the superstition that gentlemen may not engage in it; and to indicate the great age and force of the taboo he quotes a paragraph from Xenophon, the historian, written four centuries before Christ,

"The arts that men call vulgar," said Xenophon, "are commonly decried and are held in disesteem by the judgment of states with good reason. They utterly ruin the bodies of workers and managers alike, compelling men as they do to lead sedentary lives and huddle indoors, or in some cases to spend the day before a fire. Then as men's bodies become enervated, so their souls grow sicklier. And these vulgar crafts involve complete absence of leisure and hinder men from social and civic life. Consequently, men such as these are bad friends and indifferent defenders of their country."

"A similar attitude," says Mr. Lewisohn, "has prevailed till today, particularly in England," with enormous social consequences.

In the American scheme such prejudice was weak-

er than in any Old World society; nevertheless, the line of distinction here was as definite as anywhere else. Learning was a profession. The law was a profession, leading naturally to politics. Medicine was a profession. The church was a calling and the Army was a career. Engineering had fought its way up to be recognized as a profession. But business was still business. If the attitude of business toward society was insolent, there was on the other side a certain superior social attitude toward business. How unreasonable to denounce business for wanting a high sense of social function when the professions had reserved that pride and virtue to themselves!

The only possible escape of business from a feeling of social inferiority was in a sense of power. This had been the historical escape. But where anciently it was only on occasions that the power of money achieved its irony by bringing the high-caste knee to flex in the presence of the disdained money lender, here in the modern case the power of business had come to be the paramount power. It was at last a power of destiny over society, and there was no social mindedness in it. What appeared to be a desperate impasse turned out, however, to be an opportunity, and the first of its kind to be improved in the world.

VII

Its Social Redemption

Two great needs now stand opposed.
One is the psychic need of business to be included

socially, to be esteemed, to be eased of the ancient stigma.

The other is the need of society to civilize business and so incline its power to ideals of human meaning.

You cannot say precisely how or when these needs came face to face in mutual recognition. It was nevertheless a definite event. It happened. No one brought it to pass. The genius of a people was acting.

There were certain obvious movements. For one thing, the allurements of business as against those of the professions became so great as to be irresistible. This was not the temptation of profit principally. There was power to be shared, and power is man's chief fascination. Business offered occasions of romance, adventure, combat, notable personal achievement. You may see the enticement working. Of the Harvard class of 1896, 35 per cent chose business, the rest professions. Of the Harvard class 1916, 55 per cent preferred business. Also, the problems were such as to engage the unique qualities of the American mind. Men of active imagination wearied of the futility of denouncing business from without, on academic assumptions of what it was and should be, and began to explore it from within, meaning to know what it really was. They discovered it all over again, outside of their textbooks, and found here and there in business an anxiety as to the outcome equal to their own. Different types of mentality began to meet on this bridge.

One must not forget either the epicycle of muckraking, from about 1900 to 1910, when business for its sins was boiled in the caldron of hot publicity. The muckrakers—those of them who were honest—were crusaders, out to destroy what they called the system, which was a half-mythical monster, like the Turk the knights imagined before they had fought with him. The first collisions were fanatical. But man is an animal whose mind is cheered and chastened by conflict. That is how he came to be civilized. Much was learned on both sides; mutual respect emerged. It was not exactly that there were two points of view to be reconciled; rather, the necessity was to combine them, for neither had been complete by itself.

And there was another singularly potent fact. The degree of intelligence that could be employed in mere money-making was, after all, limited; and there was so much of that limited kind of intelligence that personal distinction ceased to issue from it. All kinds of people, polite, vulgar, even morons, could get rich. The competition was disgusting. And then when the rich, having acquired their wealth in disregard of social ethics, began to seek the good opinion of society by great benefactions and people rejected them on the ground that the money was tainted, there was panic at the heart of wealth. Who were the rich? Nobody. If they built palaces and private golf courses they could not get the people they wanted to come and play with them. What was it money could not buy? Social esteem.

There was never any serious attempt to found a

cult of wealth, for the reason that the pursuit of money-making left men with nothing in common to think of, talk about or pass their leisure with. They were related only in sense of solitude. In a state of society where wealth is dynastic it is different, of course; here wealth was personal. Men did not inherit it; they made it themselves. Having made it, what could they do with it? If they forgot it and went on with the game for the game's sake, they became only more lonely and more dreaded by society.

Out of these melancholy reflections grew a passion on the part of business to explain itself. It would tell the truth, and the truth should acknowledge the past. Thus the idea of cultivating public relations, which was naïvely organized, and then exploited by a new figure calling himself a public-relations expert. He would set business right with public opinion. Often he did more harm than good; otherwise, he was handicapped by common suspicion.

That idea was not enough; it was incomplete. What it lacked came partly from the other side, across the bridge, and partly from the new mentality now entering business. This was the idea of a working adjustment between the profit motive and the social motive. As service had proved itself in the hitherto limited sense of customer satisfaction, so service in the much higher sense of social satisfaction would pay. Here we touch one of the deep springs in the American way of thinking. What is right will pay—which is to say, it will be self-sustaining. That is a test.

As the new meaning of the word "service" began to clarify, business embraced it with a kind of ecstasy. It doing so it became a profession. It will cause you no difficulty now to understand how and why the meaning of wealth has changed. Wealth continues to multiply at a rate hitherto unimagined; men as individuals are richer than ever before. Yet nobody any longer cares how rich a man is, nor does society fear the power of business. How that power is used, with what intent and with what result —that is all anybody now regards. And there is an expectation that it will be used under a sense of social responsibility. So, much more than value, quality and service stations, we now expect of business that it shall act upon such problems as the proportional division of the wealth product, the continuity of production, stability of wages, unemployment, elimination of drudgery, the cultural value of labor, human relationships in industry generally. The more we expect it to do so, the more it does and will act upon them.

In the field of education it is making a significant contribution, as something it expected of itself. This is so newly conceived that there is nowhere any proper survey of its extent and character. Formerly it was that business took human material as it happened to be and shaped it roughly to the task. Now more and more it acts first on the man, to discover his aptitudes and qualities, and then finds him his right place. Even long after the subject of personnel had been recognized as one proper for scientific study, the approach was wrong. The

personnel management first analyzed the job and then looked for the man to fit it. The new way is to analyze the man and then find the job to fit him, on the theory that both the productive result and the cultural value of work are benefited by suiting the job to the man.

And now for the first time there is a working contact between the academic world and the world of business. The pedagogues said to business: "You complain that the colleges turn out men who have no idea what your world is like. That is true. The trouble is that we do not know your world. Tell us about it." So now what begins to happen is that business, anxious to get what the colleges can give, but in a form in which business can use it, writes up what are called job specifications.

The pedagogue says to the student, "Here are the particulars of that world outside, the reality of it. Look over these job specification sheets and see what is there that might interest you as work."

When natural interests have been thus disclosed, business takes the student into its own schools of engineering, specialized training and research, and tries him. He may have been wrong. It may turn out that what he thought would interest him fails to do so. Well, then he is tried in other material; he may be tried many times before he finds what is really his.

There are happy accidents from this method, apart from the average result. One of the great motor companies had a young college man who apparently possessed every quality save the one of

sustained interest. Why he kept failing nobody knew.

At last he said, "I must have been wrong entirely to think I was interested in business. I'll look for something else."

The personnel management urged him to try it a little further and moved him blindly to the spark-plug department. There suddenly he became deeply interested in a thing nobody could have guessed. Enameling, it was. In three years he became not only an expert but an authority in the world on enameling.

One function of the American Council on Education is to keep and improve the contact between these two worlds. This is from the report of last year's annual meeting of the Council:

"Industrial coöperation was the theme of an address by Mr. J. W. Dietz, of the Western Electric Company. Mr. Dietz represents the American Management Association, which joined the council last fall to help develop close coöperation between colleges and industry in solving their common problem of personnel training. He first traced the evolution of present business and industrial philosophy concerning education. . . . The most interesting feature of this growth has been the discovery of the importance of the individual in industry. . . . Through . . . practical experiences in helping individuals to help themselves industry is learning how to liberate individual talent and is evolving a real democratic philosophy of business. . . . This evolution in industry has paralleled the evolution in

education. Schoolmen also have discovered the importance of the individual. Therefore, we have a common problem in dealing with the individual. . . . We are now ready to start on a new basis. We will report to you significant facts concerning the requirements of industry. . . . We ask you in turn to report to us significant facts about personnel and training."

VIII

The Word and Spirit of Service

And with all there is yet a deep trace of snobbery among us. It has unconscious manifestations. One way of its appearing is in the form of a melancholy solicitude about people lest they be demoralized with prosperity. Is there not great danger that in running after things they will lose their souls? This dread of materialism is at bottom snobbish. When material things were differently divided, the few having much and the many very little, there was almost no fear that the few, by reason of their possessions, would lose their souls.

It appears again more pointedly as ridicule of the word "service." Foreigners sneer at it. Well enough. But some Americans sneer at it, too, and most of all such as have for any reason taken to themselves the vanity of dedicating their work to social service, preferably to mind the morals and manners of society or to scold it upon them. It is as if they were saying, "Service is all right if you have the culture to know what it means, but when

bankers and plumbers begin to talk of service it is too common to mean anything."

The word is common and much ill used, yet in its true meaning it may well turn out to be one of the important words of this century. They sneer at it who would be embarrassed to answer you this question: What does it mean that once a week at midday, in more than two thousand cities and towns, one hundred and twenty-five thousand men sit down together under a self-imposed rule of compulsory attendance, beneath the slogan *Service Above Self* and mingle their thoughts and experiences "in the effort to reconcile the conflict between the desire for profit for oneself and the obligation and duty to serve others"—according to the text of Rotarianism?

Rotary is only one cult of service. It has absurdities. So has any religion. If it were fundamentally absurd or insincere, its growth from a meeting of four friends in Chicago in 1905 to a group of two thousand four hundred and twelve clubs in the United States would reduce life to the importance of a comic strip. It has spread to forty other countries, all taking their charters from the Rotary International at Chicago. An evangel of service above profit in business going forth to the world from Chicago. How little we understand it ourselves!

But it is difficult for other countries to master the idea. At a dinner in Vienna a Viennese Rotarian asked an American guest what kinds of people were Rotarians in the United States. All kinds, he was told; anybody in business subscribing to the code.

At this the Viennese was disappointed, for there they had been trying to make it aristocratic, open only to the elite of business. In Italy also they make that mistake. In England not quite so much, but the English were the most distressed by the singing and robust geniality. Once they had tried the singing, they liked it better.

A Belgian visiting this country on a Rotary errand was asked if the movement in Belgium was touching the intimate public relations of business. As he did not understand the question, it was illustrated in the simplest way. A small-town American plumber had been heard complaining of the trouble he was having with a certain job from defective material and other frustrations, and to the general tale he added, "You know I belong to Rotary now, and—well, that makes you think." The Belgian listened attentively, with a bothered expression and shook his head. It was illustrated then in another way. A Chicago Rotarian invited the whole club to lunch at his factory, with no word that anything out of the ordinary was to happen. When the club members arrived each one was met at the door by a workman in overalls, and so they paired off and sat down to lunch. This puzzled the Belgian even more.

"We are beginning," he said. "We have not this spirit."

When in two illustrations the thought of service both touches the quality of a plumbing job and acts upon human relations in large industry, you must suppose it has gained over men's imagination the

authority of a spell. If that were all, one might take it provisionally as being perhaps ephemeral. But there is all the time a deep need for this idea of service to exist. The zeal with which it is embraced is a measure of that need. As it is important that men should have a sense of cultural value in their common tasks, so it is necessary that other men of the same piece of human nature should have a sense of social value in their daily business. It is the same thing. The need of it is at the top as it is at the bottom.

It is necessary for the kind of men now in control of the steel industry to see themselves as steel producers, with competition to meet, mechanical and chemical problems to solve, costs to be considered, profits to be calculated, all as before; it is necessary also that they shall see the industry in its social aspect. It is not steel primarily they are producing. Steel is only the accidental form of a tissue stuff required by the whole social organism. Steel making in that view is a process of metabolism. It is the breaking down of crude materials in order to bring forth forms of substance essential to the life of society.

It is a necessity of the inner mind for those now in control of business to see that the difference between good times and bad times is much more than a difference between profit and loss; it is a difference between society well and society sick. Thus stability becomes a social ideal, and as you work to realize it you are serving both society and profit.

IX

Penetrations

Business could not hope to become a profession without becoming also a civility. In a few years there has taken place an extraordinary change in its manners and customs. As an idea of service has come to govern its external relations, so the thought of let live is coming to be its internal law. Competition is perhaps keener than ever, but the old ferocity has gone out of it. Competition is in achievement, not in killing.

A fine example of the new spirit occurred during 1927 in the automobile industry. As the outsider imagined, a drama was preparing. Henry Ford, having lost a great share of the low priced motor car market to the General Motors Corporation, whose Chevrolet had overtaken his Model T, went out of production and was recreating his industry to produce a new car, obviously with intent to recapture that market. Wall Street, thinking in the old language of lethal struggle, said there would be no more profit in the motor car industry until Ford had either lost his capital or caused his competitors to lose theirs. It could see nothing less than a collision of giants in mortal combat, as in the days when merely an offensive gesture among the behemoths of industry was enough to produce a Stock Exchange convulsion. In the midst of this suspense Alfred P. Sloan, jr., president of the General Motors Corporation—Ford's only great rival—gave an interview to the newspapers, saying: "I

do not think many of us appreciate the tremendous debt we owe to Mr. Ford, not only for his conception of an idea, but his sticking to it. . . . If the past is any indication of the future, the new Ford car will be a car that will appeal to a great mass of people. . . . Any manufacturer that will give to the public a definite number of dollars' worth of value and do it constructively and honestly will get a certain proportion of the market that belongs to that number of dollars. There is plenty of opportunity in the world today for Mr. Ford to give the public honest value, which of course he will do, with the result that he will sell an enormous number of cars per year, and there is equal opportunity for General Motors to give the public honest value at a higher price and likewise sell a very large number of cars per year."

And Mr. Ford, when entertained with the outsider's notion of the struggle that was coming, said simply: "No, no. Nothing like that. They've got their job to do and this is ours. If we can't do our job better than anybody else then somebody else will do it. That's all."

Business is not a finished civility. Neither is civilization finished. It is almost as easy to prove as to say that practices do often depart from the code to which the practitioner has solemnly subscribed. That means very little, or only that human nature is what we already know it to be. What remains is significant. That is the need of business in the sense of its own meaning to have codes, even codes higher than the average of practice.

The ideal is more important than the default.

Under the head of business ethics one might collect a most extraordinary set of documents—the codes, that is to say. There is hardly any definite group of big or little business that has not written for itself a code of ethics—undertakers, coffin makers, photographers, restaurant keepers, jewelers, fishermen, druggists, advertising men, credit men, optometrists, lumber dealers, grocers, icemen, plumbers. Generally the code is a restatement of the Golden Rule, to which will be added specific prohibition of internal practices peculiar to the trade, together with a declaration holding the group morally accountable to the public for fair dealing. There are seldom any penalties. What is stated therefore is a standard, not a law. Delinquencies, of course, are very frequent.

But what does all this code making represent? First a desire on the part of every business group to raise its self-esteem; secondly, a desire to possess the good opinion of the public. Neither one desire nor the other is likely to decline; both will rise. The moral basis is firm.

In much larger aspect are the great trade associations, each one representing a major division of industry and business. Here a very old principle is newly acting, which is nothing else than the true principle of civilization, requiring first and fundamentally that the individual shall be willing to forego his own immediate advantage for the good of the group. Trade associations in this character, setting the welfare of the industry above the selfish in-

terest of any member of it, stand for law in place of anarchy and contain the idea of self-government. Their authority is founded on the possession and interpretation of facts concerning the industry itself, its relations to other industry and its relations to the public. If the industry needs housecleaning the association will do it; if it is out of rhythm in the economic scheme, that also is the association's concern. With the Government there is contact by committee. There are now seventy trade-association committees—called the Hoover committees, because so much of it is the work of his suggestion—through which business brings to the Government problems it cannot solve by itself, sometimes for the reason that, although it may know all the facts in its own case, it does not know them for industry at large; or, again, because the prestige of the Government is needed to impress certain facts on the imagination of business.

For example, committees representing the building-material industries came to the Government saying they foresaw a great building boom and were fearful that for anything they could do to restrain it there would be a speculative runaway market in building materials. Though they were the makers and sellers of building materials, they did not want that kind of market to happen. In the end it would react upon everybody in a disastrous manner and cause depression in building. What could the Government do? Mr. Hoover, as Secretary of Commerce, published the facts and upon the facts proposed that building be rationally conducted. Dwell-

ings first, industrial building only as it was really needed, public building to wait. The suggestion was enough. One result of it was that during three years the largest building program in the history of our country was carried through without a runaway market in building materials.

From the trade association that enables an industry to see itself whole and govern itself by the tyranny of facts it is only a step to a form of apex authority that shall enable business entire to see itself in the same way, as a system of reciprocal functions with one rhythm to keep and one vision to hold. And when this happens we shall begin to glimpse the true vistas of modern industrial society.

So, at any rate, the dread power of business is taming itself. The forces acting upon it are intelligent selfishness, civilized perception and a feeling of social solidarity. It is unimportant to note that it is not quite tame, nor is it necessary to prove that any of these new meanings discovered in it are completely established. Once the right way has been found, that is enough. Destiny is not served by a bump of location. What it requires is a sense of direction.

TOMORROW

I

The Question: Is Prosperity Unlimited?

THE chronological age of this nation is just more than 150 years. As great nations go, it is nothing. Taking the whole of recorded human history as one day, the American extension of it is the last half hour. In that time we have created a material standard of living that is not only the highest in the world; so far as we know it is the highest ever attained in the experience of the human race. It is still rising; and now, more than the level, it is the rate of rise that concerns us.

Our annual product of divisible wealth is greater than our total national wealth was thirty years ago. That is to say, we now consume each year more than our total possessions were then. The Bureau of Internal Revenue finds that the income of the American people in the year 1926 was $90,000,000,000 as against $62,000,000,000 in 1921. That was an increase of more than 40 per cent in five years. If this prodigious movement continues for another ten years we shall have abolished ordinary poverty, and we are the first people since the expulsion to come within sight of that goal.

If is the theme. Will it continue?

The question in that common form has a certain implication—namely, that prosperity is phenomenal. It happens, or does not happen, or stops happening. To ask if it will continue is like proposing

a question to fate. But if you conceive prosperity to be a product of forces and ideas for which people themselves are responsible, you will ask: Can they go on with it? That is the right question. It suggests a line of inquiry proceeding from the facts.

Those who regard more the superficial wonder than the meaning of American prosperity seem to find it very difficult to reconcile a sense of its reality as achievement with a sense of its unreality in time. All this to have happened in the last half hour of history! So there is a way of speaking about Americans as if they possessed youth, with all the advantages, perils and illusions of that estate. America's coming of age is a European topic. What after that? A fall perhaps; the beginning of disillusionment.

Not very long ago the settled Old World view of us was this: "Wait until their free land is all taken and they begin to crowd up. Then their troubles will begin."

The refuge of free virgin land is exhausted and we are beginning to carry water to the desert, yet agriculture is more productive per man that ever before. We have begun to crowd up, yet density appears to work no prejudice upon well-being, and it is the lot of the least favored that has been most improved.

Now it is the world's opinion that our troubles will begin when our prosperity breaks. It is this ecstasy of prosperity that holds us together in a kind of superficial amity, above antagonisms that are fundamental and reckless of problems we have

yet to face. We are walking until now in a juvenile dream.

Here are two thoughts in a state of confusion—namely, the thought of youth in people as a biological fact and the thought of an inevitable period to progress, together, of course, with the vanity of foretelling.

It is a temptation to see in the rise and fall of nations an analogy to the life pattern of the individual. A nation is born, grows up, grows old, becomes senile and falls. This is probably no more than historical fable. If instead of nations you say a people, a culture, or a civilization, you produce the same impression of cycle, period, succession, which seems to account for all that happens. You may then think of people that are old and people that are young, or establish their age, as Spengler does, by the phase their works are in, and life is represented as an endless repetition, governed by no principle of progress.

This doctrine is pessimistic; it is also very consoling to people in certain circumstances. It solaced the Greeks as they regarded the spectacle of their own decline. They had lived and were old. All things had happened again and again. Even if the world should dissolve in space, it would be only to re-create itself again in the same character. The Roman barbarians, having youth and illusions, did not know this. But was old age the reason for the fall of Greece?

As the earth ages and the race continues, how can there be youth in one people and age in another?

The American nation is politically young; the American people are of the same age as the human race, which means they are some 2500 years older than the brilliant Greeks. Differences among people are not differences of age; they are differences of capacity, experience, ideas and spirit. The Greeks had no idea of progress. Yet 2000 years later they stood as a symbol of progress to a height which perhaps man would be unable ever to scale again. The European mind of the Middle Ages regarded the vanished Greek civilization with as much despair as the Greeks had found in comparing themselves with a mythical Utopia in some golden age of wisdom and felicity before them.

II

Concerning the Idea of Progress

It is a strange passion of man to deny both the fact and the possibility of progress even though he stands looking at it. Thus he binds himself to the dogma of original sin, which with the Greeks took the form of a reasoned belief that the life of the world had degenerated; and he is for that reason unable to imagine that well-being in this world may be without prejudice to redemption in the next. Until he can make an adjustment between the demands of reality and the terrors of his soul he will regard the world not as a place to live, not as a perfectible habitation, but as a region through which he must pass in disgrace. Human life, therefore, is not an experience to be enjoyed; it is trial

and expiation, and the only right use of knowledge is to prepare man for his exit.

The modern idea of progress, much as we take it for granted, is quite new. It was only about 300 years ago that it began to take shape at all, and so far as we know, it had never existed before in the human mind. It appeared in Europe in the seventeenth century, not complete, very vague at first, and for a long time it was regarded as a faith to be embraced not as a fact that could be proved. Even yet it is often so regarded. Someone is continually asking if the sum of happiness has been increased and what we know about life more than the ancients knew.

Nevertheless, the idea of progress has clarified. It implies first of all a sense of direction. Toward what? Toward perfecting the conditions of human existence. It supposes life to possess some value of its own, here and now, and the world to be a habitable place. And it stipulates that knowledge shall be made to serve the art of living. Essentially it is optimistic and so prefers that interpretation of history which conceives man to be slowly advancing.

If there is progress, naturally it will not be equal in all directions at once. It is more likely that one people at a time will lead. Hence contrasts. And it may be that the phenomenon of lethary seeming to fall upon people here and there in place and time is first a necessity of the historian and otherwise a matter of contrast. There is now a strong contrast between the state of common well-being in Europe and the prosperity of America. But the standards

of living in Europe are actually higher than was ever the case before. It is not that Europe has fallen back. It is that the Americans have advanced.

People may advance with no theory of progress. The Greeks did. An increase of wealth is in every case a condition. Thucydides, tracing the history of Greek civilization, was bound to conclude that the key to it was the increase of national wealth. But we begin now to distinguish between wealth as fortune and wealth as idea. Wealth from conquest, discovery or invention may be only a rise in fortune, and if that is what it is, then it will presently be exhausted. Certainly if there is no conviction of social progress to govern its use it will not be distributed with systematic anxiety for the common well-being, which is to say, it will not create sustained prosperity. In the historic case wealth in that character is either destroyed by the mob or surrendered to the enemy by a populace that has no sense of participation in its benefits and therefore no incentive to defend it. Thus, limitations upon the increase of wealth as fortune and sudden periods to its existence.

III

Two Fears

But need there be either limitation or period to wealth as idea? This is to speak of wealth which, whether old or new in form, certainly is new in meaning. It is to speak of material things increasingly

produced and proportionally divided under a conviction of social progress. Wealth in such character is the pursuit of people who believe that life has some further business in this world and cannot imagine that to neglect it is a way to acquire merit in any world that may come after this one.

Almost one would say, as the strength of this doctrine is among us, so is the degree of American prosperity. That is not to say the idea of progress belongs to us. It is a common possession of Western civilization. But wholly to possess the imagination it requires a casteless social structure. That was here. Two other conditions were satisfied—namely, optimism as the dominant mentality and a strong preference for the practical use of knowledge.

These conditions and qualities are durable. So also are the ways of thinking and feeling that have produced an American science of management, an American profession of business, an American theory of proportional division, liberating the forces of production in our economic scheme. The way is proved.

Nevertheless, there is a kind of vague anxiety among us. People have advanced before, sometimes very fast, as if each step forward accelerated their speed; then suddenly they have stopped and lost their momentum for no exact cause, unless it was that they had no idea of social progress as a principle and were simply on a rise of fortune.

Assume that with us the idea is complete, even that we are the first to possess it completely, and still,

is there not some hazard in the pace? It has been terrific. Can we keep it? If so, for how long? Is progressive prosperity at this rate a reality?

In these searchings of the horizon you may recognize two fears; and then, having discovered what they are, you will be struck by the fact that one logically annuls the other. They cannot both be true.

One is the fear that we may be touching the extreme limits of machine craft, method and science as means whereby until now we have increased the productive power of labor and thus multiplied the annual output of wealth in a consistent and prodigious manner.

The other is a foreboding that the power of the machine will turn out to be uncontrollable. It will overwhelm us at last. The multiplication of things under a system of mass production will reach a point at which we shall be unable either to consume or sell our surplus output. Then the catastrophe. Depression, unemployment, social distress and disrhythm as phenomena of overproduction, on a scale perhaps never before witnessed.

The first is a rational anxiety. The other is founded on a riddle. But if one fear is valid, the other is false. If there is any reason to suppose that we have nearly exhausted the scientific possibilities of mass production, it would be silly to fear overproduction; conversely, if there is danger of overproduction, then it is absurd to worry as to whether or not the wizardry of machine craft, method and science is at its apex.

Nevertheless, these two fears lie side by side and give rise to the question: Can we go on?

Since there is no denying the riddle, it may be well to take that fear first.

IV

Overproduction Classically Regarded as a Menace

Overproduction is a word that makes no sense whatever to people who have yet nowhere near all they need or want; on the other side, its meaning is quite clear to the industrialist who has on his hands more goods than he can sell and may be ruined by them. Such discrepancy of view naturally did not escape the scrutiny of the economists. Long ago they began to say there was no such thing as overproduction; the trouble was underconsumption. That might be so; yet there were the crises all the same. And in each case the fact was that industry had ruined its profit by producing more goods than people could buy. If that was not overproduction, what was it?

The economists said the confusion was from thinking of general overproduction. Certainly there could be no such absurdity. It was only that certain things had been excessively produced in relation to the total of things. Nevertheless, these certain things were desirable things and the wanting of them in general had never been satisfied. Next it was perceived that when the industrialist said he had produced more goods than he could sell he meant only to say more than could be sold at a profit. At

this point the whole economic subject comes open. What is profit? What is value? What is price?

Having wrestled with the slippery monster of overproduction until their minds were sore, it was not uncommon for the economists to propose that he be chained. One hundred years ago, before railroads, telegraph, electric power or gas engines, one Sismondi, a famous economist, believed the state should intervene to retard production and check invention because wealth, increasing so fast, had become unmanageable, and in any case it was not worth the crises. A few years later John Stuart Mill, expounder of classical economic doctrine in England, doubted whether mechanical inventions had any social value whatever and despaired of a rational way with such problems as that of apparently an overproduction of divisible wealth in a world yet so full of poverty, until society had reverted to a stationary state, with no fetish of progress.

Such was the form of the riddle and such was the confusion of thought among economists, some blankly despairing and some upholding the doctrine of cycles, down to the year 1914. At that time there were only five great industrial nations, called surplus nations because they had a surplus of machine-made goods to sell—three in Europe, one in America, one in Asia. And these five, with the whole world to be their market, were continually passing from one crisis to another in consequence of having overproduced things of use and value. Business generally was conducted on the assumption that

crises were inevitable and periodic. There was no help for it.

During the war the industrial capacity of those five nations was enormously increased. That is not all. Since the war, machine craft has spread to the four ends of the earth. This is for two reasons. The war left, among other lessons, the one that when force is abroad in the world a nation without machine power of its own is helpless and contemptible. That is the political reason. The machine becomes a symbol of strength and liberation to millions of people who had never thought of it before. The other reason derives from example. Which were the richest nations? Those, of course, that were most highly industrialized, exporting manufactured goods in exchange for food and raw materials. Therefore industrialism was the open road to national wealth.

So now, moved by thoughts of power, independence and profit, people that formerly were the principal customers of the five great surplus nations are founding industries of their own, with intent not only to supply themselves but to compete in foreign trade for gain. Italy is bent upon an industrial career and is seriously competing in motors and textiles with England, Germany, France and Belgium. Next Poland has the same ambition. China is doing it, notably in textiles, and that is why she is resolved to get control of her tariff gates. Japan now goes to Egypt looking for a place to sell cotton goods because the Chinese market is increasingly self-supplied.

But Egypt is England's market, and the English textile trade is groaning. India is vowed to be-

come industrially independent. Instead of selling raw cotton to Manchester and buying it back in the form of cloth, she will spin and weave her own raw material and is beginning to export cotton goods. Australia, instead of selling raw hides, prefers to make shoes for export, and is doing it. Brazil, where there was almost no industry before the war, now is self-contained in a long list of manufactured goods. Ireland, the Union of South Africa, Greece, Spain—they are all fostering infant industry.

One at a time, they come to the wonder of quantity and find the law of it, which is an inverse relation of cost to volume. The more of a standard thing you can produce, the cheaper it is to make and the lower the price at which you can afford to sell it. Thus competition tends to become fixed in staple machine products rather than in things unique and naturally less competitive. Already there are more ships on the seas than can be made to pay; yet nations that can afford it are building new fleets in which to send forth their goods, for that also is in the example.

Now as you look about the world you see in every direction what is called excess industrial capacity. Machine power has multiplied faster than buying power. The five great industrial nations that were the principal suppliers before the war—England, France, Germany, the United States and Japan—have the capacity to flood the markets of the world with goods; and there are, besides, all these other nations becoming industrialized for purposes both

of self-containment and competition. If there was any profit in it the world's output of industrial wealth could be increased perhaps one-half in thirty days and doubled in six months; but if the power of production were so released prices everywhere would collapse. Again the calamity of overproduction. Generally the effort is to restrain production, especially in Europe, by such means as cartels, international trusts and agreements to partition markets.

V

Its Other Meaning

Well, there is the riddle again. The need of the world is to increase its wealth; at the same time this apparent economic necessity to limit the production of it.

In this country, though actual production runs very high, still there is an excess capacity against which one sets the symbol X because nobody knows how great it is. Some estimate it conservatively at 25 per cent; others say it may be 50 per cent. In the motor industry it is definitely accounted for. There is capacity enough to produce 9,000,000 motor cars a year; there is a market for not more than half that number. The excess capacity in that case is 100 per cent.

The existence of all this excess capacity is a restraint upon prices and therefore a kind of horizontal limitation upon profits. If the demand increases, the output rises. The tendency is for

prices to fall and profits to shrink. A new phrase has appeared in the world of business—profitless industry. The volume is large and rising; the profit tends to decline, and there is constant dread of such overproduction as will swallow up profit entirely.

Europe's contemplation of the prospect takes a gloomy turn. In Italy, for example, you will be told that notwithstanding their handicaps, such as the want of native fuel and ore and fibers, the Italians will succeed in the competition because the people will endure a low standard of living. This is a characteristic way of Old World thinking. That nation whose people will perform the most work for the least wage will triumph in the industrial struggle. Thus, parallel, a tremendous increase in the world's power of wealth and a world-wide competition in poverty! Is it an illusion?

We understand, of course, that the Europeans are obsessed by a fallacy. Low wages and low standards of living do not spell low labor costs. We have proved that high wages and high standards of living not only are compatible with but do actually favor, low labor costs. It is all a matter of increasing the productivity of labor. Therefore we say the European thought is wrong, and so it is. But we have an enormous fallacy of our own, deriving from the same riddle. Regard it.

We are lending to foreign countries, principally Europe, as much as two billions a year, and from this lending comes the delusion of a thriving foreign

trade. In reality a great deal of it is not trade at all. Trade is exchange. When, systematically, you lend your customers out of your till the money with which they buy your goods, that is not trade. You are neither selling nor exchanging. You are simply lending.

If one attacks this delusion, how is one answered?

In this manner one is answered: "Unless we lend them the money they cannot buy our goods. If they cannot buy our goods, what shall we do with our surplus? It is true, we may never be repaid. We may be obliged to treat our foreign lending as a permanent investment abroad, actually unrepayable. Nevertheless, in this way we do find an outlet for the surplus product of our machines. At any cost our machines must be kept going at ideal capacity, for if we begin to idle them, up will go the costs of production and goods will become dearer. Not only that; buying power at the same time will fall, because people who tend the machines will be disemployed. Better even to give our surplus away than to slow down our industrial mechanism."

What a preposterous dilemma—that a people whose own wants are still far from a state of full satisfaction should nevertheless be obliged to lend or give away a large proportion of their annual product of wealth just to be rid of it, for unless they are rid of it quickly it will assume the diabolical form of overproduction and react upon them in a disastrous manner.

Yet this passes among us for sane economic doc-

trine. As a logical projection of it, one may imagine a time to come when we shall have to sink our industrial surplus in the sea or invent a Moloch to consume it.

We know better. Guided only by our faith in the idea of human progress, we have stumbled beyond doctrine and logic into a region of common sense. We have found the road to unlimited prosperity, but with no light of theory, so that although we are moving in the right direction, still we are in semidarkness.

More than any other people, we do consume our own surplus. That is why we are prosperous, why our standard of living rises. We do not consume all of it. We have carried the riddle along with us, not realizing that in the body of our experience there is already enough truth to reduce its terms to reason.

First take overproduction in the reverse aspect of under consumption. Why is it ever the case that people are unable to buy the wealth they have produced by their collective exertions? They have created it, yet they cannot enjoy it. There it lies, unsalable, a liability on the hands of business and a provocation to those whose labor is locked up in it. Seeing that what people lack is the money to buy it, the solution seems very simple to a naïve type of mind. Increase the volume of money. But that is no cure at all. You might print money and hand it around and all that would happen would be a rise in prices.

VI

Two Reasons Why People May Be Unable to Consume What They Produce

There is no hope of cure until you have properly diagnosed the disease. Underconsumption is an effect from one or both of two causes—namely, first, that the distribution of national income as wages, profits and interest is not such as to represent a proportional division of the annual product of wealth through the whole body of society; or, second, that too much of the annual product of divisible wealth is reserved for capital purposes.

Wealth devoted to capital purposes takes the form of more industrial capacity—that is, more plant, more machines, more power—and if you go too far with this, adding up capacity when there is already an excess of it, you withhold from society the means wherewith it might otherwise have satisfied a great number of immediate wants.

Such statements have unfortunately a very abstract sound. It is a weakness of the economic language. Imagine the simplest case. A farmer who already has all the barn space he can use decides nevertheless to build a second barn, thinking he may some time need it or that building is a good way to save money. The cost of the barn will be one-third of his year's income, and because he devotes that part of his income to this unnecessary capital purpose, his family is obliged to do without such things as a motor car, a radio set, silk stockings and electric lights. There you have a true

case of underconsumption. The barn is an addition to plant and equipment; but the money locked up in it had better been spent to increase the family's enjoyment of life. You have on one hand an increase of capacity to excess—barn capacity—and on the other hand a minus demand for automobiles, radio sets, silks and electrical appliances.

We have by no means solved the problem of underconsumption, but we have discovered the two causes and now attack them.

Here for the first time in the world appears a theory of proportional wages, which means such a distribution of the nation's total annual income as will enable labor to participate proportionately in the increase of divisible wealth. It displaces all former wage theories. The last and most advanced theory before it was that wages should be calculated on the cost of living. That was to maintain a certain high standard of living.

The proportional theory goes much beyond that. It contemplates no certain standard of living. What it intends is that the wage earner's way of living shall rise as the national output of wealth is increased. Under no other theory is it possible for people to enjoy their own surplus. If wages are so calculated as to insure a fixed standard of living and then wealth goes on increasing, what shall be done with the increase? It cannot be sold to those whose labor has contributed to the production of it, because, with wages based on the cost-of-living theory to provide a certain standard of living, the buying power of labor will be stationary.

From the idea of a proportional wage distribution it is only a step to the idea of proportional profits. One in fact entails the other. There cannot be a proportional distribution of the annual income in the form of wages and a disproportional allotment of it in the form of profits.

There is left the other cause of underconsumption —namely, that too large a proportion of the annual product of wealth is devoted to capital purposes, like the unnecessary barn. This also we are attacking with original thought. That trend of thinking among us which puts emphasis on use and consumption, or the utmost satisfaction of human wants as an end, over wealth regarded as a possession, is illustrated in a new idiom of speech. Where formerly we spoke always of capital when we meant such things as factories, machines, power plants and raw materials, now more and more we say, inclusively, producer goods. And we understand that producer goods also are to be consumed and have no other use. Machines, structures, railroads, mills, ships, all forms of capital, are consumed in the process of creating the kind of wealth we call consumer goods. The only difference between divisible and indivisible wealth is just this difference in the use of things. They are all to be consumed—consumer goods immediately, producer goods ultimately.

As consumers, all of us, we know a great deal about the state of consumer goods, whether they are scarce or plenty, dear or cheap. Every bargain we make tells us something about it. We know very much less about the state of producer goods—that

is, whether they are increasing or decreasing and at what rate in either case. And until very recently producers themselves, meaning the managers of industry, knew very little about the state of producer goods in general. Each separate industry might know a good deal about its own and little or nothing of conditions for industry as a whole.

Recall again the unnecessary barn. That represented a use of income for what we had formerly called a capital purpose. But you see also that the barn properly comes within the definition of producer goods. Nobody eats a barn. A barn is something a farmer needs in order to produce what people do eat. The effect of building the barn was to deprive the family of its proper enjoyments. That is precisely the effect upon society in general from increasing producer goods too fast or unnecessarily, and therein appears the importance of a balance between the proportion of a nation's annual income that must be reserved for capital purposes and the proportion that may be set free for purposes of immediate division and enjoyment.

It was only five or six years ago that Mr. Hoover began to talk of underconsumption as a social liability. We were saving too much and spending too little. What was the good of developing our power to create wealth faster than we diffused the enjoyment of it? Too little of the annual income was distributed and too much was taking the form of indivisible producer goods, with two consequences. Excess industrial capacity was created and consumption was restrained.

Since then Foster and Catchings, of the Pollak Foundation for Economic Research, have made several important contributions to a new literature, uniquely American, on the subject: Why, with the wants of society still unsatisfied, does industry from time to time slow down for want of consumer buying power? Their conclusion is that overproduction—still regarded in the reverse aspect of underconsumption—is owing mainly to the fact that the means of production do not expand in any orderly, preconceived manner, but by sudden impulse, like the farmer's impulse to build the unnecessary barn, with spasmodic effect upon the buying power of society.

The idea is taking ground. Presently it will strike the imagination, and when it does we shall see that to progress in wealth by a series of violent wavelike movements is wasteful and unintelligent. A new responsibility will be added to business—namely, to see that a balance is kept between the power of production and the means of enjoyment. Thus the problem of underconsumption will be solved.

How the balance shall be kept is a matter that may be left to our genius for trial and error. The principal difficulties belong to vision and administration. It will be necessary, certainly, for business to be able to see itself whole in relation to entire society. Exactly suited to this purpose, as if there had been some instinctive foreknowledge of its use, we have been developing a system of new sense organs. These may be called our statistical eyes. They are set in

different bodies, such as trade associations, chambers of commerce, the Bureau of the Census, the Department of Commerce and various private organizations that furnish weekly and monthly index numbers, graphs and tables to show the state of production in separate industries, barometrics of trade, the strength of demand, the trend of prices, the level of wages, the buying power of money, the rate of national saving and what disposition is making of the annual income in certain significant directions, as in building.

Nowhere else in the world does business receive and give information as it does here. It has not been possible in other countries to develop the statistical sense organs to a high point for the reason that business will not surrender the data about itself. Only recently a census of production in Great Britain, which in any case would have been three or four years old when it was finished, practically failed for want of data. Business refused to supply the figures.

American business was like that twenty-five years ago. Its affairs were conducted in separate yards, each one jealously guarding its own secrets. And its secrets were not so important, after all. There were no statistical records, no diagrams, no charts—no way whatever whereby business could visualize itself. A business possessing a record of its own customers was very rare. There was no exchange of ideas or information. How far away that time seems!

VII

Overproduction Regarded as the Price of Greater Plenty

With all this to the sign of progress, yet the riddle is not resolved. Underconsumption is, after all, only one aspect of the problem of overproduction. Suppose that between the power of production and the means of enjoyment an equilibrium has at last been established. The rhythm is perfect. There is no such thing as a surplus of divisible wealth which those who have produced it are unable to buy. This is ideal. But now there is the danger that society will tend to become static; and if there is not that danger, then there is the certainty still of overproduction.

What is it that happens? A textile manufacturer discovers a way to double his output with no increase of labor. That means he has found a way to reduce his costs and improve his profit. Naturally he will double his output. A shoe manufacturer makes a similar discovery and so acts accordingly. There are like occurrences in various industries. With what result? More or less suddenly there is an abnormal supply of goods, beyond the normal growth of demand. Prices fall. Manufacturers who have not changed their methods have to shut up. Labor is let out; its buying power is impaired. Again that old chain of distressing social and economic consequences from an increase in the output of actual wealth.

It was at this point that Sismondi prayed for the intervention of the state to retard the increase of wealth and check the wild onrush of invention.

Consider, however, that the consequences, no matter how severe, are immediate and temporary. Ultimately, from the cheapening of goods the use of them expands, demand rises, rhythm is restored and society is richer than before. How are these consequences to be regarded? What do they represent? The answer is fairly obvious. They represent the price we pay—a price nobody can think how not to pay—for the continuous readjustment of costs downward.

What has been supposed in the illustration is actually all the time taking place in modern industry, else there would be no cheapening of goods and no progressive enjoyment of wealth. Take any great industry and see how the members of it fall into three groups. One group, normally the largest of the three, is making no profit. A middle group is making ends meet and no more. The third group, almost invariably the smallest, is making a handsome profit. It is so generally true that the no-profit-makers and the bare-end-meeters together constitute the majority, that you are bound to wonder if normally there is any profit in industry as a whole. Probably not, just as probably there is no profit in agriculture as a whole. The profit makers in the minority group are the low-cost producers. The no-profit-makers are the high-cost producers. What they stand for is obsolescence.

No one could put it more tersely than Henry

Ford. He was asked to say what he understood overproduction to mean.

"Overproduction," he said, "means something out of date. That's all it means."

"Something out of date would be a thing obsolete in either price or kind—is that it?"

This he studied for an instant, and said: "Of course you could overproduce buggies at any price. Nobody wants them at all."

Recently an entire industry presented itself at the Department of Commerce Clinic, asking for someone to tell it what it should do to be saved. Profit had departed from it and the cause of this was overproduction. The assistant chief physician took it in for examination. True, the industry as a whole was in a bad way and profitless. Nevertheless, some members of it were doing very well. There were others who had changed neither their methods nor their products since before the war. Yet these, all in a state of obsolescence, were those who complained most of overproduction. They could show, of course, that the industry was over developed. Its capacity was excessive. Therefore, merely to keep going, they were bound to produce a surplus. What could not be proved was that there was any excess of up-to-date capacity, efficiently handled, with low costs of production. Merely, there had accumulated in that industry an abnormal amount of obsolescence.

From this the question: Who is to blame for the surplus? Is it the high-cost producers who cling to their old methods and keep going until their capital

is gone or the low-cost producers who come in with new methods? There is the same question in agriculture. Is it the one-mule cotton grower in the old South or the machine farmer in Texas who makes the cotton surplus? The competition of the Texas tractor farmer with his low costs is very hard upon the cotton growers of the old South and sometimes reduces them to distress. What then? There can be no doubt as to which contributes more to the wealth of society. All you can say is that progress is not without cost.

The high-cost producer is losing his capital. And surplus, or overproduction, considered in this light, is not what at first it seems to be. What it really represents is the destruction of antiquated capital. The realistic view is to say the sooner it is lost the better.

As concerning the immediate social consequences, which in the instance may be very harrowing, we appear to have no new thought about them. But they are greatly mitigated in this country by two facts.

The first is that as you solve the problem of underconsumption by a theory of proportional division, the rhythm that may be broken by a sudden increase in the supply of cheapened goods is much sooner restored. There is at all times a tremendous buying power in reserve; thus demand quickly overtakes a new supply.

The other fact is that as we destroy capital faster than any other people in the world, so at a corresponding rate we create new capital in place of it, even faster than we destroy it, so that the total body

of it is always growing. In the motor-car industry, for example, there is hardly a trace of the capital that existed fifteen years ago. A few old walls, perhaps; all the rest has disappeared, some of it lost, some of it purposefully destroyed to make way for new. In order to produce a new motor car to succeed the obsolete Model T, the Ford Motor Company alone in six months probably junked more capital in the form of machines and equipment than the motor-car industry of all Europe had scrapped in ten years.

The American motor industry is doing this all the time. That is one reason why it is the largest single body of dynamic capital in the world. It is the great symbol of our economic philosophy. In no other state of society had it been possible, certainly not where the ownership of industry is dynastic and feudal.

VIII

The Second Fear Annuls the First

And what was the other fear—the one before the riddle? You may have forgotten. It was that we had begun perhaps to touch the effective limits of machine power and method. If that were true, further progress in wealth would be at a much slower rate; the curve of our ecstasy would begin to fall.

To be rid of this fear, one needs only to change the point of view. If the first sign of wisdom is a conviction of ignorance, the beginning of efficiency

is a sense of not possessing it. Hardly have we passed that point.

Judged by other people's standards, we are industrially efficient. There is a worldwide legend of it, just as before the war there was a legend of German efficiency, which turned out to be something we had imagined about them. They had no word for it themselves, nor have they one yet. They were only intensive. Efficiency requires imagination, and they were not imaginative. Judged by any ideal standard of our own, our practice at its best is imperfect and at its worst so bad that one wonders how we can be prosperous at all in spite of such appalling waste of labor, time and material.

Efficiency, as now we perceive it, is a new dimension of thought. We have been exploring it for only a short time. Five years ago a motor company advertised the fact that its material traveled 3.5 miles from the point at which it entered the factory to the point at which a car stood completed. It advertised this. Now a motor company boasting that its material made a long journey through the factory would be supposed to have fallen into the hands of lunatics. Anyone would know better. Distance is time and time is cost.

Owing partly to the kind of mentality that went into it to begin with, and partly to the fact that there were no traditions of how, the motor-car industry is our highest example of efficiency. Yet the rule is that where you find it at its best, there also you find a management so disgusted with the waste and awkwardness it still sees in its own practice that

it wants to tear the whole layout down to the ground and start all over. What is more, it will.

Obsolescence is from inertia of the mind. And this disease, you will find, is the basic trouble in the low-wage industries that still wish for cheap foreign labor to keep down their costs, complain of overproduction and exist in a state of chronic liability. A poor industry is a sick industry. It is governed by men who say the nature of their product or the conditions surrounding them make it impossible for them to do what the motor-car makers have done.

If you could look at a motor car without knowing what had been done with it, or how it was produced, you would say it was of all industrial products the one least likely ever to be acted upon successfully by the principles of mass production. Comparing it with a brick, a pair of shoes, a bolt of cloth or a piece of furniture, you would say that any of these things might be more easily submitted to intensive multiple manufacture than an automobile, which perhaps forever would have to be made one at a time, slowly. Then when you see how motor cars actually are made—first the automatic multiplication of parts from patterns and then the bringing together of the parts with such precision of time and action that from the moment an automobile begins to take shape it picks up its wheels, its engine, its transmission, its body, and so on, as it moves and never stops until it is finished—seeing this, you might say, "Yes, but how does this method apply to a brick that has no parts?"

How does it apply to glass that has no more parts

than a brick? Henry Ford asked that question. He thought of making his own glass, and asked: "Why can't glass be made by a continuous process like an automobile?"

He was laughed at by the glass makers. A man who thought glass and automobiles were similar things! But they are similar things—that is, they are both artifacts derived from raw materials. Now the glass makers come to look at his glass plant, the first of its kind in the world, where the sand and other materials spill out of a chute upon the hearth of a furnace and never for one instant stop moving until the glass is polished and cold and stands on edge before the inspector.

IX

Efficiency as a New Dimension

Mass production, you see, is not a method. It is an idea. The method is what will be determined by the nature of the problem in a specific case. The idea is to move materials through the process of manufacture with the least possible expenditure of time and labor. Not only is that idea applicable to any industry, and to agriculture as well; the limits of it have never yet in any case been touched. Moreover, it is only beginning to be understood. Take but a few examples of the spread between relative efficiency and obsolescence in the important industries.

"Most brickmaking plants in the United States today," says Ethelbert Stewart, Commissioner of Labor Statistics, "are using precisely the same method

as that used in Egypt with Hebrew slave labor at the time Moses led the great brickyard strike, which I suppose the Egyptian brick manufacturers considered a failure, since the strikers' places were taken by strike breakers."

He finds expenditure of human energy per thousand bricks to be in one plant four man hours and in another plant 13.5 man hours. Thus in the better plant the productivity of labor is more than three times as great as in the other. He found in one Chicago plant a machine delivering 50,000 bricks an hour and calculated that if the whole brick industry were so equipped it could release 80 per cent of its workers.

In the iron industry, the Department of Labor finds there are blast furnaces that require eleven hours of human labor to make a ton of pig iron and blast furnaces that require only one hour. There the productivity of labor in one case is eleven times what it is in the other. There are shoe factories where the output is two pairs of shoes per worker per day and factories where the output per worker per day is twelve pairs. There are sawmills where the output per man hour is fifteen board feet and others where it is 350 feet. There are flour mills with an output of 9000 barrels of flour and other flour mills with an output of 2500 barrels, per man per year.

In every case the obsolete plants pay lower wages and have higher labor costs than the efficient plants.

Coal mining is one of the sick industries. The output of coal per man is very much higher here

than in England, and the American miner's wages for that reason are higher. Comparing our coal industry with England's, we may think it fairly efficient. Testing it by our own common sense, we know how inefficient it is. The Department of Labor says that one-quarter of the best American mines, highly equipped and working 306 days a year, could produce all the coal we could use and sell, with only 60 per cent of the miners now engaged.

"In other words," it says, "250,000 men in this industry must be out of work all the time, which means that the entire 700,000 are being wasted one-third of the time."

There was a question to be answered. Were we approaching the end?

From the most casual survey of American industry one is obliged to say that the idea of efficiency is only beginning to seize our imagination. It has yet very far to go.

Until now the competition between manual labor and machine power has survived. There is still that competition in other countries, and to challenge it in principle causes the utmost bewilderment. A European manufacturer, seeing in this country an operation performed by machines that in his plant is done by hand, inquires the cost of the machine. Then he says:

"But, you see, in my case wages are so low that hand labor is just as cheap. In any event, the difference is so small in favor of the machine that it might take me five or six years to save the cost of it. Therefore it would not pay."

X

Vast Margins

Here machine power is preferred in principle. For that reason competition between manual labor and machine power is disappearing. In a few years more your emotions at the sight of human beings performing any labor that might be done by a machine will be very disagreeable. We are on the way to abolish drudgery. That is another goal.

Old industries have to learn the idea. New industries begin with it. For example, there is the beginning in this country of rubber culture. We could not hope to produce rubber as the method is on the great plantations of the Far East. American labor would not undertake it; nor could anyone wish it to do so. What was the alternative? To import cheap labor? No; but to bring the idea to bear on the problem. That was done. And as American rubber culture now is contemplated, with machine power, the output will be 25,000 pounds per man per year instead of 1700 pounds in the Far East. That should make it worth our time. Wages such as no Malayan or Javanese could dream of and lower costs per pound because the output per man is fifteen times more. For the same reason we can grow rice in California with high-priced labor and sell it at a profit to Japan in competition with rice produced by low-paid Chinese labor in China.

Productivity per man hour is one thing. Until now we have been rather preoccupied with that effect. Productivity of labor as a whole is another

thing, and there is a field in which enormous difficulties are still to be overcome. From a study of pay-roll data for industries employing 11,000,000 wage earners, the Department of Labor concludes that instability of employment, seasonal idleness, turnover, drifting and such causes, all more or less removable, entail an annual waste representing the labor of 1,750,000 men, in normally good times. Hitherto a condition of fluctuating employment has been taken to be inevitable. At least, no one was to blame for it.

Now occurs the thought that continuity of employment is one of the great responsibilities of business. Why take such pains to increase the productivity of labor while it is employed, thereby saving it, and then let it run to waste wholesale in unemployment? There is the average annual productivity of labor as a whole to be considered; and that, of course, is reduced by unemployment, with exactly the same effect upon the buying power of society as if its productivity had been limited in any other way. Progress in wealth is retarded; anything that checks the continuous flow of wealth last and first is bad for business. People cannot consume unless they also produce. The idleness of 1,750,000 men for want of stable employment is a load upon society and a liability to business. The only excuse for it is that the idea of efficiency has not yet extended to the ultimate problem of business, which is to solve the terms of its universal relation to life.

There are many signs that it will do this, not so much because it proposes to do it as because it is

bound to do it, from an impulse taking strength in its own nature. A fact we seem continually to slight is that business is no longer trade, pursued primarily for gain by a minority cohort with certain more or less common characteristics. We used to speak of the instinct for trade, and not without justification. It was by no means the highest human trait.

Modern business is a new condition of life. It directly absorbs much more than one-half, possibly two-thirds, of all the genius, imagination, intelligence and greatness of spirit produced by society. Leadership, passing over to it, wears down the ancient barrier. Where should leadership be found if not where the dominant qualities of a people are?

The war called it forth in a surprising manner. The function of business in any war before had been that of purveyor. Then for the first time the life of war, like the life of peace, assumed primarily an economic aspect, with problems as to which statesmen, generals and military bureaus were quite helpless.

When the war was over, the dollar-a-year men returned to business, and now you will find them, one in a banking office who for his services as administrator in some foreign country whose language he did not know has been decorated by three governments, another quietly pursuing the profession of engineer who with more power than any czar partitioned the sinews of war among the Allied combatants, or another in retired circumstances who held in one hand the entire economic power of America and with the other moved food, munitions and

raw materials to and fro in the earth as if it were a two-foot chessboard, and so on—hundreds of them.

This new power of leadership strikes downward. We are beginning to understand it. There was a fine illustration of it in the handling of the Mississippi River disaster. It is Mr. Hoover's story. He and his staff were working ahead of the flood. First they picked the towns of refuge. Then they thought of someone, Y or Z, who knew the people in each of those towns. They called Y or Z on the telephone asking, "Who is the man in X town best qualified to take command in a great emergency?" Having got a name, they called it on the telephone, and said to the person who acknowledged it: "You will receive in your town 5000 homeless people in four days. Go to the local bank for money. Your checks will be honored there. Appoint a committee with arbitrary power to do anything that is necessary. Build some barracks. You will need a commisariat, doctors, nurses, and so on. . . . All right? . . . Good-bye."

Only one town in ninety-one failed. The point is that the natural local leaders upon whom the responsibility fell in this sudden manner were in every case men of business, with here and there a type that might be called the business farmer.

Once it was, not long ago, that the power of business had an ominous meaning, for it was increasingly a power over the means of life, having within it no controlling sense of social responsibility. With that sense rising, the view deepens. What busi-

ness now seeks is power over itself, with intent to discipline the anarchic impulse. As it conquers the exploiting motive it will discover the principles whereby the law of competition is reconciled with what Bellamy called complex mutual dependence. Each for himself and each for the other.

What follows is scientific control of the economic circumstance. More and more what happens will have been intended. Then we shall not ask what the business augury is or whether we are happily to receive another year of prosperity, as if we were navigating an economic sea in a sailing ship, with headway, leeway or disaster a dispensation of weather. We shall ask, instead, what the program is; it will be published beforehand as a common plan, so that everybody may know what is expected, and there will be a statistical score, as simple as the weekly report of freight car loadings or the daily standing of base ball clubs, to show the rate and scale of performance. How strange it will then seem, that people once referred the state of prosperity to a theory of cycles, or supposed their material progress was conditioned by a wriggling line on a sheet of quadruled paper showing the level of money reserves in banks!

That is to say, all as may be. It is rationally possible. Certainly there is no longer any reason in nature why the production and exchange of wealth need be limited otherwise than by human intention.

MACHINE PEOPLE

I

Man's Fear of Machines Is Dread of Himself

THE spirit of man is in his machines. He sees it and is afraid. So also his spirit was in pyramids and temples. Yet these evoke simple feelings of awe and admiration whereas the machine inspires a sentiment of dread. Where lies that difference?

The wonder of a pyramid is monumental. The wonder of a temple is beauty. But the wonder of machine is function. There is the difference.

The machine is the will of man engined. It is the free extension of himself in a new dimension and that is the dimension of force.

Having as out of a dream raised up this force, the spirit of him externalized, and seeing how for good or evil it may be multiplied by itself without end, the conjurer has moments of terror. It is not the machine he fears, though he says it is.

First and last he has believed in many jealous gods, all inhabitants of this dimension. He has not yet met one of them face to face, but as he stands on the rim of knowledge, where light ends, groping for more elemental facts, and remembers that he knows only how force acts and nothing at all about what it is—then, well, nothing that might happen would greatly surprise him. There is that.

But much more it is that he fears his own nature. The history of the human spirit is that often it

sees the better way and takes the worse. As the spirit is so must the machine be. Demon spirit, demon machine. Thus there will be good and evil machines and some good and some evil in any of them. The machine itself is not terrifying. What possesses it may be. This is man afraid of himself.

Fear moves the whole theme against science. Any one of its many variations may be so referred back. And that few are entirely free of it may be inferred from the fact that protagonists of science themselves contribute to the fear theme, as in the following expression, which is representative:

"Already the applications of science to human affairs have far outrun the ability of man to use them wisely. The engineer has provided agencies of incalculable value in time of peace, but they are also endowed with prodigious powers of destruction which can be loosed in time of war. Unless we solve the problems encountered in man himself the outlook is dark, indeed, and it may even be questioned whether our civilization will endure."

This was said recently in an atmosphere of science by one of a board of trustees named by the National Academy of Sciences to collect and administer a national fund for the support of research in pure science. The speaker subscribed to the thought that "science carries within it not only the seeds of its own destruction but the seeds of its own salvation." Therefore, he said he was optimistic; he proposed toward salvation more knowledge, especially scientific knowledge of human behaviour. His optimism, contemplating a social organism with

million-minded knowledge and power, appears to rest on the assumption that knowledge increases wisdom. Yet the problem, as he himself stated it, was that knowledge had outrun wisdom.

Every other variety of the theme is pessimistic. Religion, advancing the claims of faith against reason, complains of scientism that it absorbs man's idea of God and leaves him spiritually desolate. It takes away his beautiful myths, the inner truth of them along with the tale; it has made him to regard himself as an ascending beast, responsible to his wayward will; it has delivered him in bondage to his senses and reason, with all of life that proceeds from the heart left out and no way to satisfy the transcendental cravings of the spirit.

Among ardent religionists and modern mystics are those who propose a science holiday for so long as may be necessary to restore the lost prestige of the soul. Some would make it forever, wishing for mankind a return to the middle ages when faith and reason were reconciled in one body of knowledge and human thought reached to heaven. Yet even these will speak of a science of religion, a science of morals, a science of ethics; and their science holiday would turn out to be a selective suppression. They would doubtless wish to keep alive the sciences that pertain to hygiene and medicine and perhaps as much of the science of biology as could be limited to plant and animal life. They would admit astronomy and orthodox philosophy as belonging to the tradition of classical learning. Mathematics, that

once had equal rights in that estate, would have first to be purified because it has latterly been a powerful tool in the hands of the profane. Zones free and forbidden would be necessary in chemistry, a little of which is needful to medicine. This of course leads to hopeless confusion.

It is not science they are talking about. Only certain effects of science are deemed sinister, or such new knowledge as tends to increase man's ecstasy of self-extension in power on earth.

The foreboding of the scientist is that with too much knowledge man may be tempted to destroy his civilization. What will save him is wisdom. Religion's foreboding is that with too much knowledge he will destroy his soul. What can save him is faith.

It is true that knowledge will alter man's ways of thinking about nature and God. That has nothing whatever to do with his religious feeling, which, though it may be intellectualized, has not its source in the intellect and is probably, as a scientific fact, an instinct. Great scientists have been believers and non-believers, always in the individual case for a reason that could not be given. Faraday who captured and delivered to inventive mankind the force of electro-magnetism, belonged to a small sect that hired no preachers; and if the world where his fame was had wanted to find him on Sunday it would have had to look for him in the pulpit of a little church in some unheard-of village, preaching a sermon on the soul.

Steinmetz, a recent worker in the field opened by Faraday, once drew a map to represent the idea of sequence in the wave phenomena of cosmic energy and so divided it into octaves that it suggested the key board of an organ. Other scientists, seeing it, wished copies of it, and so it got scattered around.

A man at the top of a great private research laboratory accidentally turns up his copy in the way of looking for something else and thinks you may be interested. Beneath the chart is a typed text, pasted on.

"Did Steinmetz write this?"

"No," he says. "I did that."

This is the pasted-on text:

The Keyboard of God's Organ.

(Over sixty octaves.)

The flash of lightning,
The roll of thunder,
The wonder worker, electricity,
The far-flung wireless waves,
The searcher for truth, light,
The conserver of life, heat,
The X-rays, with their gift for divining the unseen—
Are stops under the control of the master organist.
Never out of tune,
Perfect harmony,
No interference,
No friction,
The energy of the universe.
Why doubt God's existence.

II

All Wheels Do Run by Faith

Some heavenly creatures once came calling on Ezekiel in a vision. Each one of them had four faces—cherub, lion, ox and eagle—and they were in other details wonderful; but Ezekiel particularly noticed their celestial motor vehicle. The rims of its wheels were high and dreadful, set with eyes, and: "The appearance of the wheels and their work was like unto the color of a beryl, and they four had one likeness; and their appearance and their work was as it were a wheel in the middle of a wheel. When they went they went upon their four sides, and they turned not when they went."

He concluded that the spirit of the creatures was in the wheels.

You would hardly expect a prophet to seize at a glance the physical principle of a four-sided wheel that seemed to go on its four sides without turning. That principle may yet be discovered. If this ever happens we shall call it science. But with that kind of wheel in his hands, though he were moving the traffic of the world by means of it, still would the true scientist admit rationally what is stated emotionally in the negro spiritual:

> Ezekiel saw the wheel
> Way up in the middle of the air.
> Little wheel run by faith,
> Big wheel run by the grace of God,
> Way up in the middle of the air.

Here, besides the rare æsthetic perception to make poetical use of a mechanical image, is a profound truth. Every wheel we have is a wheel within a wheel. Every wheel that runs does run by faith, though you take it to be only the faith implicit among us that the big cosmic wheel will run true and not fail. And what makes the big wheel run at all nobody knows.

Do you know what happens when you turn the switch to light the house or cook the food or start the electric motor? At the power station they know many more facts about it than you know. In the laboratory they have some scientific theories about it. But at last, really, no one knows any more about this force of electro-magnetism now touching our every-day existence at every point than you know yourself when you turn the switch. You know what will happen. You know what that force will do. You do not know what it is, nor does anyone else know.

Certainly no one would hold that science is more unreligious than art, especially modern art. Yet art supports the case of religion against science. This it does on æsthetic ground. The machine is making the world ugly. Machine civilization with its standards and methods of mass production is sunk in idolatry of a fabulous materialism, power, wealth, success. Where is culture in this vulgar scheme? Where is nature?

But what art fears is that its own world of remembered images, ideas and relations will be swallowed up; and it cannot imagine how to create an-

other that will contain this new reality. The world of machine civilization is set with strange forms. These are not symbols. They are direct facts, unhaunted by human experience. They have no analogies, no associations, no past. They exist for the first time originally in the present; therefore they recall nothing. That is why they are not symbols. Their meaning is not in them; it is outside of them, in their functions. There is no art tradition of how these machine forms may be seized by the æsthetic sense and made into art forms, nor of how people may be related to them in feeling.

Ruth gleaning in the fields of Boaz stands in a simple three-fold relation to the universe, to the earth, to her man. She may be perceived æsthetically. Art can tell her something she would not otherwise know about herself.

Ruth in three ounces of rayon minding a machine for capital—how may she be perceived?

That was life and art included it. This is life and art excludes it. Man interrogating the serpent is art material; man interrogating the atomic table is not. Art has nothing to tell him about himself. It does not see him æsthetically, which is the only way of seeing that can justify art; and therefore it is probable that he will not see art. Nevertheless he will see many wonders.

Philosophy, too, has a case against scientism. This is high altitude. Philosophy once contained physical science and then set it off as a satellite. Now the moon behaves in the manner of a planet, expecting other bodies to revolve around it.

Between philosophy and science, nevertheless, is a working relation that cannot be broken. When science cannot get any further with facts alone and is blocked for want of new ideas it takes its facts to philosophy asking for another hypothesis to fit them. Philosophy proposes a new hypothesis. It may or not be true, but science, returning with it to the field of experiment, says, "Let's behave as if it were true and see what will happen. At least we may be able to knock down some new facts." That is generally what happens. True or false, the hypothesis is a weapon for prizing new facts out of the unknown. Facts are required to prove it either true or false. The facts that prove it to be untrue may be strange enough to suggest a new hypothesis, and so the procedure is.

All of this, says philosophy, is quite right. That is as the relation should be. But when science becomes impatient with the rate of progress in the region of pure thought, where the hypothesis should come from, and enters it to find one on its own account, it very often forgets what it came for and ends by inventing a whole new system of thought, generalized from physical facts; and that is not its right business at all.

It is the affair of science, says philosophy, to explore the cause of phenomena, whereas it is the affair of philosophy to consider the cause of cause. It is not for science to comprehend philosophy, since philosophy comprehends everything—the whole, that is to say—and of the whole, science for all its luminosity is merely one part. Philosophy compre-

hends also religion, art, ethics, first cause, the purpose of life and the meaning of meaning. Science, not knowing its own limitations, is likely to betray man with the delusion that an account of the universe in physical terms is an account of everything in it, including himself. That is a disaster philosophy dreads.

Here is dangerous walking for the common lay person. He shall watch his step. Yet he may trust himself to recognize feeling in any language, and it is with feeling that philosophy argues the matter. For this purpose it takes anything it likes from religion, art or ethics, as it rightly may do, since it comprehends them; and then as it comprehends science also it is in a position to scold science out of its own text. It remembers many things about science that science itself would just as soon forget. There was a great scientist who reduced the universe to a mechanism, and said: "In this system there is no need of a God." He was right unawares. There was no need of a God in his mechanism for the reason, as it turned out, that there was no such mechanism. It would work mathematically, but not in any other way. Facts destroyed it. Mathematics is the scientific mind's tool of precision. Yet more than once with that tool speculative science has proved the existence of a non-existent universe.

Philosophy accuses science moreover of idolatry and confusion. It has been heard worshipping a god named ether that had promised to explain all the mysteries of the physical world. This god was invisible; his existence could not be proved. But

science said his existence was not at all important as a fact, only as an idea, and it proposed to behave as if the idea were true. Proposing, therefore, to found a physical doctrine on a metaphysical assumption. At another time science has seriously considered matter to be nothing but a series of holes in an imaginary medium. First it tries to explain the unknown by the known; then it proposes to explain the known by the unknown.

There is a rational solution that occurs even to the stupidity of the lay person. The world is too complicated. That seems to be the trouble. So why not take it that Berkeley and Hobbes were right. One reasoned away matter; the other reasoned away mind. In that case there is neither mind nor matter, neither materiality nor immateriality. There is nothing left to explain. Nothing exists. Then science perhaps could make a world fit for human understanding.

Now science, injured in its feelings, will be heard from in its own case. In the first place, if it were stupid it would not have this immense authority to be challenged. There is a certain structure. At the top is speculative science. There the mind is intellectually naïve, purposefully. It will take anything to be true, or one and the same thing to be both true and untrue or neither true nor untrue. This is the mind that may say: "We know by our senses that the world is round. But let us suppose it is flat and look at it that way." It is perhaps unfortunate that what happens in this region of thought becomes audible. No matter. From a

beam of light passing for the thousand and first time through a prism, from the chance contact of two pieces of substance, or from one instant of irrational curiosity, may come a fact that will open suddenly a whole vista of strange knowledge.

This is discovery, and there is no technic of it. Galileo in a cathedral, gazing at the swinging lamps, perhaps because he was bored, discovered the law of the pendulum. This was of no practical use whatever. Merely a fact. Then someone invented a clock, all but one troublesome detail. How could the revolutions of its wheels be regulated? Ah, the pendulum!

Many years ago a physicist named La Grange might have been seen in his laboratory playing with a stretched string that had been loaded with tiny weights at equal intervals. He would have said he was trying to make a mathematical analysis of the behaviour of mechanically vibrating bodies. He noted certain facts of phenomena, gave them large names and reduced them to a generalization that had no relation whatever to anything real that people then had ever imagined wanting. Later the telephone was invented. People did want that; and having found how convenient it was in the neighborhood they wished to extend it over wide areas. Then the problem of how to transmit electrical vibrations long distances over a tiny wire. In the search for a solution of this problem La Grange's work was remembered. In view of analogies discovered since his time between the behaviour of mechanically and electrically vibrating bodies, what did those little

weights on his string suggest? A device now called the loading coil. Without loading coils at equal intervals along a telephone wire, behaving as the little weights behaved on La Grange's string, long distance telephony would be practically impossible.

III

Exploring the Absolute Sea

The pure scientist, fishing in the absolute sea, is not an inventor. In the field of invention is the practical science worker with a problem given. Something is wanted, like a machine to tell time. He may have it all but the pendulum. If the law of the pendulum has not been discovered he is stuck. It sometimes happens that he will then go fishing himself beyond the rim of knowledge with miraculous luck. Nevertheless, discovery for its own sake, above the plane of invention, has the use of increasing the stock and variety of pure fact-knowledge, which is to increase the probability that the particular fact the inventor needs to solve his problem will exist when he wants it, like the law of the pendulum.

The modern idea of true scientific method is that new facts and the theories that correlate them shall continually descend into the hands of the practical science workers who make the crude, experimental models. It is on their benches you see the wonder of idea in the anguish of trial reality, spirit commanding matter and endowing it with form, purpose and function. The work of these is handed down to

the field of technology, where the technician, the engineer and at last the mechanic bring the economic reality to pass.

The whole sequence lies in the history of the dynamo. An Italian scientist named Galvani in 1792 happened to get a piece of iron and a piece of copper into the leg of a dead frog, both at the same time. The leg jerked. Thereupon he announced excitedly to the scientific world that he had discovered the source of electricity in a frog's leg. Another scientist named Volta said that was ridiculous; it couldn't be in the frog's leg; it must be in the conjunction of frog's leg, iron and copper.

From this controversy came the true discovery that two metals immersed in acid produce an electric current. There, then, was the battery, which at once became the wonder toy of every scientific laboratory. Quite by accident it was discovered next that a wire charged with current from a battery had power to magnetize a near-by piece of iron. This meant that something jumped from the charged wire into the dead iron.

Thus scientific electrical knowledge stood until one day it occurred to Faraday to say, "If something jumps from a charged wire into a piece of iron to magnetize it, why won't something jump from a piece of magnetized iron into an uncharged wire?" He made a coil of wire and attached the ends of it to a galvanometer, which was an instrument Galvani had invented to register electric current. The purpose of the galvanometer was to show if anything jumped from the magnetized piece of

iron into the wire. Then he stuck the magnet inside the coil and looked at the galvanometer. Nothing was jumping. "No good," he said; but as he took the magnet away he happened to notice that the galvanometer needle moved slightly. So he put the magnet inside the coil again. As it was going in the galvanometer needle moved, then stood still again. "So!" said Faraday, "Maybe the magnet wants to be wiggled." He wiggled it and as he did the galvanometer needle moved; if he stopped wiggling it the galvanometer needle stopped. This proved that something did jump from a magnetized piece of iron into a coil of wire, provided the iron magnet was kept moving.

Well, there is the complete principle of the dynamo. That is all a dynamo is—a revolving magnet within a coil of wire. Yet Faraday, having made this discovery, did not invent a dynamo. He was not an inventor to begin with, and, besides, before anybody could work with his facts they had to be formulated. A mathematician did that. Years elapsed before there was any practical application of the formulated scientific facts to the everyday work of mankind. It was necessary for someone to have the idea that to be able to carry power further from its source than the reach of a shaft or a belt would be a great convenience; and it was necessary for that idea of a thing wanted to connect with the idea of means. At last the thought came. If it was true that electric current was energy, and true that you could produce it by revolving a piece of magnetized iron inside a coil of wire, then why couldn't

that energy be led away by wire from where it was produced to any distant point at which you wished to use it?

Thus was added the economic link to complete a chain of events by which now all the electric power in the world may be traced back to the jerk of a dead frog's leg under the eye of naïve scientific curiosity.

All of this is science in its own case. And if it were a body with a mechanism where the feelings ought to be it might rest its case on the evidence and say no more. But it belongs to life; therefore it is controversial and has a spirit of retort. Reason can no more let faith lie than faith can let reason lie.

Science boasts of having delivered man from darkness and superstition. Only ten generations ago faith burned a man for saying the earth revolved around the sun. Galileo, who founded experimental science with a thud by dropping two bodies of unequal weight from the top of the leaning tower of Pisa to prove that the sacred Aristotle had blundered—he was imprisoned in his old age, not precisely for that impious act but because, besides, he held with Bruno that the sun was the center of the universe; and although he recanted, still he was imprisoned lest he should say it again. Even long after this the pioneers of modern science wrote down their discoveries in cypher, backward, upside down and mirror-wise, fearing the fate of heretics. Some of these writings, notably those of Leonardo de Vinci, perhaps the most gifted experimental scien-

tist since Archimedes, are not wholly deciphered to this day. The literature of science current—the latest book or notable speech—will still recite the roll of martyrs.

Then there are those, not themselves scientists, who lisp the language of science with literary skill and say such stupid things as that philosophy is the pursuit of infantile minds and cannot survive the facts. This makes only a sense of scandal. What is a fact? The simplest fact, if pursued, leads science to what it calls an explanatory crisis, as every scientist will admit.

That science has moods of intolerance and sometimes forgets the distinction between dogma and hypothesis is merely a weakness that keeps it kin. But of all its reactions the one most human is to the taunt that in this scientific age human progress, if it may be called progress, is forward, not upward. To this science answers it is not a scientific age. Witness Dayton, Tennessee, or the fact that in thirteen states people have tried to pass laws forbidding the evolution of man to be taught in public schools over the myth of special creation.

As it regards the material universe the scientific mind conceives order—complete, perfect and sublime order—and is moved thereby to awe and reverence, often to a state of deep religious feeling, with or without a specific God image. Then it turns to regard human society and conceives it to be a bedlam, a muddle, torn by disharmonies and uproar. And this it accounts for, saying the material universe is the work of nature and therefore scientific;

but man made society, and society is artificial and unscientific.

As to the conclusion, it is probably wrong. Society and everything belonging to it must have existed from the beginning as a potential within nature. Society, therefore, is a natural thing. If not —if society is an artificiality and a disorder—then nature contained the potentiality of artificiality and disorder, wherefore her own order is not perfect. But in any case, here are certain interesting implications. Does the theory of evolution hold for the species man only up to the point at which he became a social animal and began to make society? If so, the law of evolution is not absolute, since it breaks; if not, and the law of evolution holds for society, how is it that a law of nature has produced a result, namely society, which the scientific mind calls unscientific?

IV

No Way to Go Back

If at this point the question were moved it would be: Shall man go back to an age of faith that he remembers or shall he move on through doubt and uproar, pursuing the idea of a scientific commonwealth?

The mystic who says back has the advantage of being positive. Science says forward in knowledge and all will be well, provided the problem of man himself can be solved.

It seems a terrible dilemma; nevertheless it is sup-

posed that man has this choice to make. The scientific mind supposes it. In a brilliant little book entitled "Daedalus, or Science and the Future," J. B. S. Haldane, of Cambridge University, stops to consider whether the pursuit of scientific knowledge is likely to be abandoned. "It is after all," he says, "a very recent form of human activity and a sufficiently universal protest of mankind would be able to arrest it even now."

He may have been thinking back to Archimedes who, on discovering the law of the lever, exulted: "Give me whereon to stand and I will move the earth." Many years before Christ the Greeks and Alexandrians imagined cog wheels, pinions, pulleys, steam power, pumps, pneumatic and hydraulic machines, and had enough sound knowledge of the physical and mechanical sciences among them to have begun at that time the true scientific age.

What they lacked was the economic motive. The Romans who succeeded them had no feeling for science; they had only military and political instinct. After the rule of Romans came the rule of faith. Man moved his whole treasure to heaven; and forbade himself on pain of torture and death to rediscover what the Greeks knew two thousand years before.

The possibility that this history may be repeated is a theatrical thought. The imagination delights to play with it. However, a crucial fact of difference is left out. Probably because it had no economic motive behind it, or for want of time, or for any reason that may be, the fact is that Greek

science did not enter the scheme of life. They got no further with it than theory, description and model. Though the whole of it were lost or forgotten life would go on as before and on the same scale as before. But if this knowledge had been used to multiply the means of life—steam power for engines, industrial machines and transportation instead of turning toys and swinging temple doors with it—then people had been no more likely to lose or forget it than to lose the rude art of agriculture by which they lived. Population would have increased enormously, the phenomena of industrial empire would have appeared in the Mediterranean part of the world more than twenty centuries ago, and all modern history would be very different.

There was never any absolute necessity for the machine. Life could exist without it, only, of course on a much smaller tapestry. It is use creates the necessity for the machine. The scientific use of physical and mechanical knowledge to increase both the agricultural and the industrial means of life has made it possible in our time to sustain on the earth a population that could not otherwise exist, that would otherwise have perished before it was born. This is a fact we keep forgetting. It is the fact that relates human life to science in a vital sense.

There is no way to go back.

A wish to live again in the past is very old. The future is unknown, the present is turmoil, but the past may be anything we like to think it was—a fine old ruin in romantic perspective, perfected by the imagination, and we live in it as in our dreams.

Man has always had in him the myth of a golden age, a time to go back to, a yearning for return. All of this revolt against science, this fear of the machine, this notion that knowledge may be leading civilization to an abyss, may be and probably is referable to that ancient, infantile myth surviving unawares in the modern mentality.

No rational being would exchange the whole of the present for the whole of the past, only parts of one for the other. Well, that is impossible. Nor can any troublesome part of the present be got rid of by the alternative, sometimes suggested, of standing still. The science holiday again.

It is no more possible to stop than it is to go back. Why this is true is not so easily stated. A principle of acceleration acts. We know it and feel it, our everyday calculations include it, and yet it is difficult to say what it is. Progress, though it were progress forward only and not upward, must be at an accelerating rate. Knowledge increases in that manner; so does wanting.

Epochs and ages we speak of in a way to make believe we understand them. We know much more about the present than about any past age or epoch, and yet how little we understand the present!

A way to see his own works and interpret them to himself is one of man's great needs and he is not sufficiently aware of it. When he is he will find the instruments. What they will be like we do not know, any more than it was known beforehand what the telescope or microscope would be like.

One of the classics of science is the story of Herschel, a musician whose interest in the heavens led him to become an astronomer. He had first to master mathematics. Then, as he could not afford to buy a telescope, he resolved to make one; and for this purpose he had to master the science of optics and the technology of instrument making. From a musical performance he would rush back to his lodgings to resume the labor of grinding and polishing reflecting mirrors by hand. After hundreds of failures he produced a telescope equal to any in the world and discovered the planet Uranus.

Such zeal is common among workers in the tradition of science. Ways therefore have been found to search the remoteness of the heavens to discover the past of many things, to apprehend the unknown and to see the invisible, each way with its method or science.

But where is any science of the present? We know more about the movements of astronomical bodies than about the play of everyday economic forces. There is a way whereby man may contemplate his own thoughts and yet no proper or deeply considered way whereby he may contemplate his own works and refer their significance to his understanding. Philosophical contemplation of the universe as a mechanism is a grand activity of the mind; the machine that has appeared suddenly in the earth is an object of momentous meaning, and the philosophical mind is loath to perceive it; the æsthetic mind will not.

V

The Incorruptible Image of Truth

The machine will reward contemplation. Try it. Any machine will do—the small gasolene engine on one's own premises. There is much to be learned from bringing the mind to dwell upon it.

The history of the human mind is there. Circles, true angles and the revolving wheel first presented themselves to the intuition of man as symbols of mystery and supernatural power. That is to say, they were seized by acts of religious and æsthetic perception. Reality has also that way of disclosing itself long before the facts are found out. Many years before it could be proved scientifically at all the Greeks deduced the sphericity of the earth from their æsthetic sense. The sphere was the ideal form of a solid; therefore the earth was round.

The science of experimental mechanics, raising such forms as the circle, the angle and the wheel to the power of function, was an achievement of the reason, working practically.

Invisible in the machine are physical laws. Man did not invent these laws. They are inherent in the universe. But he had to discover the facts and then formulate them as laws, and this was the work of the speculative faculty, working in abstraction.

How strange that the machine you are looking at, acting by what is proved and proving that by which it acts, should be a form of truth the signs of which first appeared in superstitious rites of magic

and had then to be pursued through millenniums of error. Even this may not yet be its whole reality. Very likely not. What perversity is error! Always the wrong way first and the right way last. In every case the right way, once we find it, is so direct and obvious that to have missed it seems the strangest fact of all.

So there many be many ways of arriving at truth. To the reality now acting in machine forms, religion, art, philosophy and science have all contributed by moving knowledge one step at a time, with no sense of direction, no goal in sight, and yet steadily hitherward. The spectacle of the human mind exerting itself blindly, erringly, victoriously, to bring about a condition it cannot foresee is utterly mysterious to the reason.

And why suppose there is or ever will be a period to that mystery? For all the knowledge we think we have, a child gazing at the machine may ask questions that will bring us at once to the end of it. Take them to be physical questions. What happens inside the cylinder of the engine? A gas mixture—air and gasolene—is first compressed, then receives a spark and explodes, driving the piston downward. But why does it sometimes knock? That question exhausts our knowledge.

Searching for the answer a physicist in the Bureau of Standards at Washington may be found at the beautiful play of exploding gases in a soap bubble. If you ask him what he is doing he will say he is making thermodynamic studies of gaseous explosive reactions. That means he wants to know

the answer to the child's question. Why does the gasolene engine sometimes knock?

In the research laboratory of a great automobile corporation the approach is from a different angle. The reason for the knock is in the fuel, namely, gasolene. Well then, what is gasolene? They break gasolene down to its parts, burn each part separately, and know what that stuff is. Then they spread out before them the atomic table and begin to search for an organic compound which added to gasolene will produce a more favorable happening in the engine cylinder. They have no idea what it will be; they know only what they want it to do, and there is no certainty that it exists. Now, the number of organic compounds that may be constructed from the atomic table, given an inch of type each for description, would fill millions of books. For all practical purposes the number is infinite. Therefore when you go looking for a certain compound, character unknown that must do a certain thing, you are looking for one grain of sand on the ocean beach. It is impossible to search the beach one grain at a time. You can only pick up a grain here and another there and examine it hopefully. So they explore the atomic table, trying this compound and then that one, and after four years they are discouraged. They have found compounds that are better than gasolene and compounds that are worse, and each one is marked on the table. So there is a point here and another there and one away up near the top, hundreds of them, in fact, but there is no drift to follow and they are sick of

just fumbling around. Then one man with nothing else to do sticks pegs into those points on the flat atomic map—an inch peg for gasolene, a half-inch peg for a compound half as good as gasolene, a longer peg for one a little better, and so on. Still he discerns nothing. But the boss scientist happens to see this peg field at a certain angle of vision and says: "I think I see a warp across the tops of those pegs. Look. Don't you see they tend slightly to grow taller in that direction to the upper left?" The others look as he is looking. They see it too. There is a warp in this third dimension and it gives them for the first time a sense of direction. Following the warp they come to something nobody had ever thought of—a lead compound which, added to gasolene, does create a more favorable happening in the engine cylinder.

The knock is the machine's own protest against error. The evil in itself is not serious. But the sound is one we hate to hear. Sound of error. This is significant. We should probably find by going deep enough for it that man's passion to perfect the machine, even the sound of it, though the upper motive is rational or economic, is really from the essence of his nature. It is as if he were proving something to himself. What science continually and rationally seeks is the constant. What the restless spirit seeks is certitude. Belief in human perfectibility is a faith of which the evidence is weak and conflicting. But in the machine man finds the principle of perfectibility. To increase its precision, sweeten its rhythm and raise its power to any sign,

he has only to discover the true laws of its being and bring them into a relation of harmony. Then logic is implicit in its behaviour.

VI

Its Effect Upon Our Minds and Behavior

It may be the spirit will not change, but from perfecting, minding and living with machines the mentality will. Certainly a machine environment will induce new habits of thinking. To act upon a machine with passion, malice or impulsive ignorance is to wreck it, and the lesson is final. To command its power you are obliged to act upon it with knowledge, reflection and understanding. It is not obedient to you; it obeys laws you cannot alter or corrupt. And since you can neither alter nor corrupt them you may trust them. They cannot fail.

The garage mechanic is not a scientist; yet he thinks scientifically. Observe him. There is trouble in the mechanism. The rhythm breaks. The power is lost or it may be only that there is a wrong sound. He takes your facts and entertains your opinion. Yet he does nothing overt at once. He listens, reflects, speeds up the engine and slows it down, cuts out one cylinder at a time by shorting the current across the tops of the spark plug, drives the car around the block, then leans against his bench and lights a cigarette. "I think I know where the trouble is," he says. With that he enters the mechanism at a certain point, goes to the spot and there it is—what he thought it was.

Now consider what has occurred in this familiar instance. What was to be found was X, namely, the cause of trouble. There were many facts in several categories—historical facts of doubtful importance from you, facts of knowledge in his experience, facts of sensation in the particular case. How has he acted upon these? By methods of analysis, analogy, synthesis, as if, is as, induction, deduction, generalization and hypothesis. He may not know what an hypothesis is. If you should say to him that he has been thinking scientifically, or explain to him the process by which he arrived at his I-think, he would be surprised. He thinks scientifically without knowing that he does and calls himself a trouble shooter. The way of it comes from experience.

Sooner from observing machines than from observing ourselves we may come to precise ways of thinking, to an understanding of the natural principles of equivalence and reciprocation, applicable also to human affairs, and to such a generalization as that a thing is for what it is for. Each part of a machine is for what it is for. Each machine in the great scheme of machines is for what it is for. We make machines with organs and chemistries to simulate creature reactions to stimuli. All of them feel. Some of them see. There are now some to think mathematically, these substituting in drudgery for the mind as others substitute for the body; but how stupid it would be to expect them to think politically or philosophically. Perhaps man shall never know what it is he is for. Nevertheless he

might very well know what his institutions and methods and specializations are for. He might know, for example, that physical science is neither for prophecy nor for handing down the social law. One would think the scientific mind as such would know this. But there has lately come over it a rage to prophesy, to say not only what is but what will be and should be in all things. And having said what ought to be believed it goes so far as to resent in the popular mind a lively scepticism, forgetting that scepticism is its own first virtue.

We are eminently the machine people. We have more machines than all other people in the world. Here the authority of science, resting upon facts and upon the thing that works, is such that no absurdity can diminish it. Credulity for that which may be demonstrated is unlimited. For the new fact there is a kind of appetite. Here at the same time is a scepticism from which science is no more immune than phrenology. Science giving law to man's works is unchallenged; undertaking to give him also the law of his being, it is challenged. The behaviour of mind in the fundamentalist, even him in Tennessee, is somewhat like this. He asks: "Is there any scientific theory of the origin of human beings that can be proved on such evidence as would hang a man in Tennessee?" The answer is no. In that case he will believe what he likes. But believing in the theological doctrine of the special creation of man he will not for that reason reject a scientific fact in plant or animal biology, say it is impossible to make a fuelless engine or impugn science as a whole. He

prays for rain. Science, he reads, thinks it can find a way to make rain. He remembers with a smile that science not long ago classed the idea of rain making with ideas of magic. If science can make it rain, so much the better. The fundamentalist will buy his rain, but he will not stop praying, nor will he agree that fact knowledge is the only kind of knowledge there is. Who shall say this is not a sound attitude toward science?

Knowledge, too, is for what it is for. A preference for the useful use of scientific knowledge lies deep in the American genius. It was the theme of Ben Franklin who may be taken as the founder of science in this country. A text for it will be found in one of the forgotten Lyceum Lectures delivered by Abraham Lincoln before he was elected President. "All creation," he said, "is a mine, and every man a miner. In the beginning the mine was unopened and the miner stood naked and knowledgeless upon it. . . . Man is not the only animal that labors, but he is the only one that improves his workmanship." And how strange, he added, that after the discovery of steam power it was two thousand years before the amazing thought occurred to anyone that it would move useful machines as well as toys.

This perfectly illustrates the difference between discovery and invention. Practical people will be very inventive in the application of scientific knowledge; it does not follow that they will make many new discoveries of their own. We are the most inventive people in the world; we excel in what is

called applied science research, that is, in finding new ways to apply what is already known. But we have no such record in the field of pure science; we have made very few new discoveries. And that is why a national fund of $20,000,000—called the Hoover fund because it was his idea—now is being raised to support pure science research. Yet even here the end is practical. The anxiety is not to improve our standing in the world's hall of pure fame; it is that our workers in the field of applied science may soon exhaust the stock of fact knowledge unless we take steps to increase it on our own account.

When Abraham Lincoln was speaking of discovery and invention in that Lyceum Lecture, year 1860, there were only five kinds of power in the world—man power, animal power, water, wind and steam. Since then two new powers have been added. Gas and electricity. At any instant another may be discovered. Where? There is no telling where or what or under what circumstances. The unknown is nowhere, meaning it is everywhere. It is in the common occurrence, in the familiar object, in the artless question, in the queer twist of a thought.

Man's passion to pursue it is a fact he can give no account of. Always he has been afraid. Does he go on notwithstanding, or is it because he is afraid that he goes on? In one case a lonely hero in the universe; in the other case a brave planetarian who would sooner meet the dangers of knowledge than bear the terrors of superstition. Once he gets

used to the idea it is much less appalling to live on a sphere whirling in space than on a flat world with edges sticking into the void. Life cannot fall off.

There is also the simple probability that he is a child in existence naturally growing up. Knowledge happens to him as he wants and needs it. That by taming wild energy he will imperil his soul more than he did by taming the wild grasses and beasts is absurd to suppose; and that it is any more likely he will destroy civilization with machines than it was that he would achieve that calamity with clubs cannot be proved as a scientific fact. As to that, your opinion or mine is as good as that of science. Whatever it is that runs ahead of us and beckons us on—it is not afraid.

WHAT INTELLIGENT AMERICAN CRITICS THINK OF GARET GARRETT'S BOOK

The American Omen

"It is just possible that a hurrying generation has not taken the measure of Garet Garrett; possible that he will not be correctly classified for many years, or even that it will not be known for many years that it is important to classify him. He does not fall into standardized classification at all. . . . What he writes will continue to be not books but the things which, with an unerring understanding, Garet Garrett sees."—Charles Willis Thompson in the *San Francisco Chronicle.*

"If anyone would understand the current American religion of business in all its strength and weakness, its faith, its dogmas and its fervor, he could not do better than read Mr. Garrett. Here we have the true American gospel." — James Truslow Adams in the *New York Herald-Tribune.*

"He has made clear some highly significant truths about American business and industry, truths which can and will be of value to the world."—John McClure in *New Orleans Times-Picayune.*

"A volume which will richly reward your consideration."—*New York Evening Post.*

"If the American people would like to know why the fateful star of world supremacy has been accorded us, they may go a long way toward finding the answer in a careful perusal of Mr. Garrett's new book."—*Ohio State Journal.*

"*The American Omen* is a great book on American manufacturing economics. As usual, Garet Garrett thinks his way through a subject and then presents his conclusions in a form not too difficult to understand. . . . Decidedly it should be called to the attention of every production executive."—*Factory and Industrial Management.*

Published by

E. P. DUTTON & CO., INC.
286-302 Fourth Avenue
New York City

READ WHAT A PROMINENT AMERICAN EDUCATOR SAYS ABOUT GARET GARRETT'S BOOK

"*The American Omen* is an appropriate title for this book. In it Garet Garrett reveals the real reasons for American prosperity—a propitious omen that portends the doom of poverty, if only we are wise enough to interpret rightly the handwriting on the wall.

Mr. Garrett begins by showing how the soothsayers from foreign lands have meticulously mapped the mechanism and sketched the structure of American industrial organization but have failed to 'get the big idea.' They fail to sense the spirit, the dynamic drive that makes the wheels go round and maintains the system as a going concern. So the author takes up the quest for the social significance of economic life. He seeks it not in philosophy but in the daily work of a busy world. With a wealth of practical illustrations, our author follows the transformation of the ancient doctrine of economics into its modern form."

DR. C. R. MANN,
American Council on Education,
Washington, D. C.